

RASHTRAPATI BHAVAN  
LIBRARY.



Reg. No. 80  
Clas. No. III (C) - A



**PRESIDENT'S SECRETARIAT**  
**(LIBRARY)**

Accn. No . . . . . Class No . . . .

The book should be returned on or before the date  
last stamped below.



THE ARCHITECTURE  
OF ANCIENT GREECE

# THE "HISTORICAL ARCHITECTURE" LIBRARY

STANDARD ILLUSTRATED TEXT BOOKS ON  
CLASSIC AND RENAISSANCE ARCHITECTURE  
UNIFORM WITH THIS VOLUME IN SIZE AND STYLE

ANDERSON AND SPIERS' ARCHITECTURE OF GREECE  
AND ROME. New Edition, rewritten and much enlarged,  
incorporating the results of the most recent researches. In  
two volumes.

*Large 8vo, cloth, 21s. net.*

Vol. I —THE ARCHITECTURE OF ANCIENT GREECE Revised  
and much enlarged by WILLIAM BELL DINSMOOR,  
Architect, Columbia University, U.S.A., and American School  
of Classical Studies, Athens. Re-illustrated with 14 plates  
in collotype, 50 pages of half-tone illustrations, and many  
illustrations in the text

*Large 8vo, cloth, 21s. net.*

Vol II —THE ARCHITECTURE OF ANCIENT ROME Revised  
and remodelled with much additional material by THOMAS  
ASHBY, D.Litt., F.S.A., late Director of the British School  
at Rome. Re-illustrated with 96 pages of half-tone plates  
and many illustrations in the text.

*Large 8vo, cloth, gilt, 21s. net.*

THE ARCHITECTURE OF THE RENAISSANCE IN ITALY.  
A general view for the use of Students and others, by the late  
WILLIAM J. ANDERSON, A.R.I.B.A. Fifth Edition, thoroughly  
revised and enlarged, including an extra chapter on Baroque  
and Later Work, by ARTHUR STRATTON, F.S.A., F.R.I.B.A.  
With 16 plates in collotype, 48 pages of half-tone illustrations  
largely new to this edition, and many illustrations in the text.

*In two volumes, obtainable separately, large 8vo, cloth, 21s. per  
volume, or £2 the set*

THE ARCHITECTURE OF THE RENAISSANCE IN FRANCE.  
A History of the Evolution of the Arts of Building, Decoration  
and Garden Design under Classical Influence Vol I —From  
1495 to 1640 Vol II —From 1640 to 1820. By W H WARD,  
M.A. Second Edition, revised and edited by SIR JOHN W  
SIMPSON, K.B.E., P.P.R.I.B.A. Each volume contains 7 plates  
in collotype and about 225 illustrations from photographs,  
old prints, drawings, etc

*Large 8vo, cloth, gilt, 30s. net.*

THE ENGLISH HOME FROM CHARLES I TO GEORGE IV.  
By J ALFRED GOTCH, F.S.A., P.P.R.I.B.A. A Review of  
House Building, Decoration and Garden Design from Early  
Stuart times to the Nineteenth Century With 300 illustrations  
from special photographs, plans, drawings, prints, etc Second  
Impression, with corrections.

PUBLISHED BY  
**B.T.BATSFORD LTD 94, HIGH HOLBORN, LONDON**



*Frontispiece*

PLATE I



THE ACROPOLIS OF ATHENS, FROM THE WEST

# THE ARCHITECTURE OF ANCIENT GREECE

AN ACCOUNT OF ITS HISTORIC  
DEVELOPMENT

BEING THE FIRST PART OF

# THE ARCHITECTURE OF GREECE AND ROME

BY

WILLIAM J. ANDERSON, A.R.I.B.A.

*Author of "The Architecture of the Renaissance in Italy"*

AND

R. PHENÉ SPIERS, F.S.A., F.R.I.B.A.

*Author of "Architecture East and West"*

REVISED AND REWRITTEN BY

WILLIAM BELL DINSMOOR

*Professor of Architecture in Columbia University, New York,  
and in the American School of Classical Studies at Athens*

LONDON

B. T. BATSFORD LTD., 94 HIGH HOLBORN

*Made and printed in Great Britain by  
Harrison, Jehring & Co., Ltd., London*

## PREFACE TO THE NEW EDITION

The preparation of a revised edition of "The Architecture of Greece and Rome," by William J. Anderson and R. Phené Spiers, had been considered before the outbreak of the European War; at that time the plan was to republish the book merely with verbal emendations and corrections, leaving it as a whole essentially unaltered. But when the project was taken up again after the long delay caused by the war, the outlook had changed; it seemed preferable to make the revision as thorough as might be necessary in order to make the book more useful and attractive to students, and to embody more of the latest results of excavation and research. To that end the book was divided into its two component parts, each half being entrusted to a specialist in the field concerned. My acceptance of the task of re-writing the Greek portion, while I was still resident in Greece, was followed by my unforeseen return to the United States, where other work awaited me; the ensuing delay in the completion of the book has permitted me, however, to take account of the important discoveries of the last six years and of observations made during my subsequent visits to Greece.

Though the final decision was to revise the work so thoroughly that it was practically a new book, nevertheless it was desirable to retain, to as great an extent as was possible, the arrangement and the language of the second edition of 1907. The method of the revision, therefore, requires brief explanation.

The stress laid upon the idea of evolution by the original authors precluded any other scheme of arrangement; the evolutionary scheme seems, furthermore, all the more desirable, because it is the opposite or analytical viewpoint that underlies most of the recent studies of Greek architecture. For this reason the material has been freely rearranged in order that it might be perfectly consistent with the chronological framework; the most obvious change is the disintegration of the original chapter (VII) on secular architecture, and the discussion of all the secular monuments in the chapters dealing with the periods concerned where, in fact, a few works such as the monument of Lysicrates and the Tower of the Winds had already been described. By drawing a sharp distinction between the fourth century and the Hellenistic period, however, the original number of chapters (seven) has been retained. Within each period,

moreover, I have attempted to restrict myself to the examples selected by the original authors and to refrain from introducing new ideas or following out lines of investigation other than those indicated by Messrs Anderson and Spiers, lest I depart too radically from their work\*. But I have, whenever possible, given the most recent versions of the theories which they discussed and, wherever their conclusions have not borne the test of later research, I have exercised the power of suppressing them or relegating them to footnotes. The one exception to this treatment has been the first chapter, which, on account of the rapid advance in our knowledge of the pre-classical epoch, is perforce almost totally new, and, dealing with the vicissitudes of an entire civilisation, it has necessarily become somewhat longer than any one of the chapters allotted to a single phase of the classical epoch. Some general material has been separated from the original first chapter to form, what it is in fact, an introduction to the whole subject.

The number of illustrations has been increased by about seventy-five, but as only fifty of the original illustrations of the second edition have been retained (and even these in part revised), the number of new illustrations is actually one hundred and fifty-two. The chronological memoranda at the beginning have been somewhat amplified, and the chronological table of Greek temples at the end of the book has been entirely recomposed, with changes not only in the dates but also, in practically every case, in the dimensions and proportions, the measurements being in all cases taken either directly from the buildings themselves or from the detailed monographs. The bibliography has been brought up to date and is here rearranged in accordance with the chapters of the book.

ATHENS

WILLIAM BELL DINSMOOR.

*March, 1927.*

\* My own conclusions, both with regard to the details of the evolution of Greek architecture and on the subject of the methods of design and construction, will be set forth in a more lengthy "History of Greek Architecture" to be published at a future date, meanwhile my study of "Periclean Architects," now in course of publication, will illustrate my views with reference to a single phase of the subject

## PREFACE TO FIRST EDITION

To the late William J Anderson, of Glasgow, is due the conception of this work. The course of lectures which, on the invitation of the Governors of the School of Art in that city, he delivered in 1893-94 on the Architecture of the Renaissance in Italy (published in 1896), was followed in 1896-97 by a course on the History and Development of Greek Architecture. To this subject he devoted his studies for three years, repeating his course with various revisions, and adding to it in 1897 three additional lectures on Roman Architecture, which, with those on Greek, he intended to publish as his second work. Immediately following these Roman lectures, he continued, in 1898, with a course which included the various styles down to the present day, and in the winter of 1898-99 a further special course dealing with the Renaissance in France.

The preparation of these courses would seem to have interfered with the studies he intended to devote to Roman Architecture in order to bring them in line with the Greek. There is no doubt that he had attained a masterly grasp of the principles underlying Greek work, more particularly those dealing with the Archaic and culminating periods, the study of which would seem to have had a special attraction for him. It was his intention to deal with Roman work in the same way, and with that in view, and being in indifferent health, he expressed the desire that I, who had been in frequent communication with him respecting the various courses he had delivered, should undertake to read and see through the press the chapters on Greek Architecture (for which, as well as for the Roman, numerous illustrations had already been prepared), so as to give him more time to devote to those on Roman Architecture. He died, however, before this intention was realised, and the whole work was then placed in my hands by Mr Batsford with the entire concurrence of Mr Anderson's widow.

In parts of the work there are some theories put forward which have not yet obtained universal acceptance; but one of the objects has been to stimulate the student's interest in the subject, with the hope that, by independent research, he may ascertain for himself, either among the treasures of the British and other museums, or in the numerous publications cited in the Bibliography, how far those theories can be substantiated.

R. PHENÉ SPIERS.

LONDON,  
*September, 1902.*

---

#### NOTE OF ACKNOWLEDGMENT

Many of the subjects included among the illustrations are from various foreign sources, and the author must acknowledge his debt to a number of Works and Transactions of Learned Societies in which these appear. Thanks are due to the Authorities of the British Museum for permission to include the subjects illustrated on Plate XIII (bottom two), Plate XXVII, Plate XLIX (centre) and Plate LI (top). He must also thank Mr. A. E. Henderson, F.S.A., and the Royal Institute of British Architects for permission to reproduce the reconstruction of the Later Temple of Artemis at Ephesus, appearing on Plate L, in the galleries of the Institute. A large number of reproductions have been made from original drawings and reconstructions in which the name of the author appears on the title to the illustration, and grateful acknowledgment must be made for the use of these subjects, which must be considered indispensable to a general survey of Greek Architecture.

## CHRONOLOGICAL MEMORANDA

- c. 8000 B.C. Beginning of the Neolithic Age in Crete.
- c. 3000 , Beginning of the Bronze Age in Crete.
- c. 2000 , Mycenaean invasion of Greece.
- c. 1450 , Achaean invasion of Greece.
  - 1184 , Fall of Troy.
  - 1104 , Dorian invasion of Greece.
- c. 850 , Age of Homer.
  - 776 , First Olympiad, the earliest recorded date.
  - 734 , Foundation of Corcyra and Syracuse by Corinth.
  - 628 , Foundation of Selinus.
  - 582 , Foundation of Acragas.
  - 569 , Accession of Ahmes (Amasis) II of Egypt.
  - 561 , Accession of Pisistratus of Athens
  - 560 , Accession of Croesus of Lydia.
  - 548 , Burning of the temple of Apollo at Delphi.
  - 546 , Conquest of Lydia by Cyrus of Persia.
  - 527 , Death of Pisistratus.
  - 510 , Fall of the tyranny at Athens.
  - 499 , Beginning of the Ionian Revolt
  - 494 , Miletus taken by Darius of Persia.
  - 490 , First Persian invasion of Greece ; battle of Marathon.
  - 485 , Accession of Gelon at Syracuse
  - 480 , Second Persian invasion of Greece ; destruction of Athens
    - First Carthaginian invasion of Sicily ; battle of Himera.
  - 479 , Expulsion of the Persians from Greece , battle of Plataea.
  - 478 , Foundation of the Delian Confederacy under Athens.
  - 461 , Assumption of leadership at Athens by Pericles.
  - 448 , Peace signed between Athens and Persia.
  - 447 , Beginning of the Parthenon at Athens.
  - 438 , Dedication of the Athena Parthenos by Phidias.
  - 437 , Beginning of the Propylaea at Athens
  - 431 , Outbreak of the Peloponnesian War.

## CHRONOLOGICAL MEMORANDA

- 429 B.C. Death of Pericles  
423 " Burning of the temple of Hera near Argos.  
413 " Defeat of the Athenians at Syracuse.  
409 " Second Carthaginian invasion of Sicily, destruction of Selinus.  
404 " Fall of Athens.  
394 " Burning of the temple of Athena Alea at Tegea  
373 " Destruction of the temple of Apollo at Delphi by earthquake.  
356 " Burning of the temple of Artemis at Ephesus.  
338 " Conquest of Greece by Philip of Macedon; battle of Chaeronea.  
334 " Invasion of Persia by Alexander  
331 " Foundation of Alexandria in Egypt.  
323 " Death of Alexander the Great  
301 " Foundation of Antioch by Seleucus.  
174 " Beginning of the temples of Zeus at Athens and Lebadea by Antiochus.  
146 " Destruction of Corinth by the Romans  
86 " Capture of Athens by Sulla  
46 " Refoundation of Corinth by Julius Caesar  
31 " Battle of Actium  
27 " Establishment of the Roman Empire under Augustus.  
131 A.D. Emperor Hadrian at Athens; dedication of the Olympieum  
c. 170 " Pausanias writes his description of Greece.

# CONTENTS

CHAP		PAGE			
	PREFACE TO THE PRESENT EDITION	...	...	...	v
	PREFACE TO THE FIRST EDITION <i>(By R. Phené Spiers)</i>	.	...	...	vii
	NOTE OF ACKNOWLEDGMENT	..	...	..	viii
	CHRONOLOGICAL MEMORANDA	..	..	...	ix
	INTRODUCTION	..	..	...	1
I.	THE AEGEAN AGE	...	...	...	9
II.	THE ORIGINS OF GREEK ARCHITECTURE	...	...	...	57
III.	THE RISE OF THE DORIC STYLE	...	...	...	76
IV.	THE RISE OF THE IONIC STYLE	...	...	...	98
V.	THE CULMINATION IN ATTICA AND THE PELOPONNESUS	108			
VI.	THE BEGINNING OF THE DECADENCE	...	...	...	137
VII.	THE HELLENISTIC AND GRAECO-ROMAN PHASES	..	...	...	160
	MAPS OF GREECE, ASIA MINOR AND ITALY	...	...	...	187
	CHRONOLOGICAL LIST OF GREEK TEMPLES	...	...	...	193
	BIBLIOGRAPHY	..	...	...	201
	GLOSSARY	.	...	...	213
	ALPHABETICAL LIST OF ILLUSTRATIONS	...	...	...	225
	INDEX TO TEXT AND ILLUSTRATIONS	...	...	...	227







# THE ARCHITECTURE OF ANCIENT GREECE

---

## INTRODUCTION

THAT works of architecture as things of man's creating are inferior in interest, in excellence of design, and in perfection of workmanship, to the humblest of Nature's works outside humanity, has often been the burden of the moralising of theologian, naturalist, and astronomer. But in this reflection lies a fallacy which is fully exposed to those who can discern in the successive intellectual works of man the path of the human spirit, and who regard them as manifestations of Nature, of which he forms a part. Mysterious and impressive the instinct which causes the bird, the beaver, the insect engineer, to build for their material needs ; astonishing the variety and intricacy of the results within the limits of the type. But the work of man is infinitely more complex in its nature, more profound in its meaning. A spiritual element marks it off from the work of animals. It is here that architecture begins. Building, whose end and aim is the fulfilment of material wants, remains building, and, whatever be the nature of the material want, differs in no essential from the work of the lower animals, but if to this be added an element of aspiration involving the exercise of a higher kind of design, there is the distinction that makes the difference. The blackbird in early spring builds a nest of a different type from that which the swallow will build later ; and in a way analogous the yellow man built differently from the white man who succeeded him, and in certain respects the artistic instincts of the Celt may be distinguishable from those of the Teuton. But above and beyond this racial expression there is embodied in the architectural work of man a spiritual striving

after the unattainable, corresponding to the progress of this never-resting civilisation, every aspect of which—every habit, belief, and aspiration—it has power to reflect and symbolise. Works of architecture in themselves are material, perishable, incomplete, but a style of architecture is one of the higher manifestations of Nature, reaching in through the human spirit. That architecture can fail in interest, as compared with the works of Nature which lie outside humanity, is not for lack of the elements of interest, but because of the greater complexity which enters into its nature, and which makes it more difficult to grasp its full significance.

But should we try to grasp as a whole one great period of architecture, one great style of art, like that of Greece, our study is simplified in finding that it presents all the features of a natural growth. Art is a flower, and, like the flower of the field, is sown in obscurity, nourished by the decay of pre-existing organisms, rooted in the mire of an imperfect civilisation, and, though refined and perfected by high culture, buds and blooms at its own time. It is in a large measure what the soil and the atmosphere and the sunshine make it; it repays the care and toil that human hands bestow upon it; yet its form and its colour are its own. And so we may not know all the causes which produce the phenomenon, nor do we now desire to look too closely into them; but we may at least watch it grow, enjoy its full beauty, and follow it in its withering, our study remaining one of purely artistic interest; for, like the plant, it is beautiful not only when in full flower, but at every stage of progress, and even in decline.

Like other simpler natural manifestations, Greek architecture, while the fruit of all the civilisations which preceded the great period of Greek culture, did not live for itself alone; for it has sown the seed of European architecture, and has determined the future form and growth of all subsequent European art. Behind and beyond the fountain-head which it makes for Western art, the tributary arts of Egypt, Mesopotamia and Phœnicia shrink into their narrower channels, their sources lost in obscurity. From it flows the main stream of European culture, the arts of Rome and the Middle Ages, the rejuvenescence of Roman tradition in the fifteenth century, not to say the prevailing architecture of the cities in which we dwell. The influence of the past upon the present is part of the nature of things in which we live and move, but rarely, if ever, in the world's history have past forms and

principles and ideals exercised so potent an influence on subsequent art as those of the vigorous, rarely dowered race which settled, perhaps more than two thousand years before Christ, on the coasts and islands of the Eastern Mediterranean.

We do not seem to be wrong in attributing this paramount and matchless influence chiefly on the one hand to the reasonableness, the perfection of form, and the high spirituality of their art, and on the other to the historic relation with Rome, which, taught by the vanquished, transmitted what it had assimilated to the subjugated ruder nations of the rising West. Whether epic or temple, lyric or bronze, it is by such indwelling qualities that these matchless products of human endeavour survived as a standard by which the world's subsequent efforts are measured and tested.

The higher flights of literature and architecture present an almost perfect parallel. Both have more of art than science, and show little progress within themselves all down the ages, while they clearly reflect the progress of the soul of man. It may be that the greatness of the Greeks is not demonstrated most of all in their architecture, but it is by their architecture, using the word in its widest sense, that we may now most readily comprehend their civilisation in all its bearings. An eminent student of Greek language and literature has said that he would exchange the work of one of the greatest of Greek writers for one peep into the workshop where Phidias and Ictinus perfected their marvellous designs. We can take leave to doubt if the sight of the workshop would reveal much that would be worth the knowing, but the perfected work which that workshop turned out, and which yet remains, is it not in itself a document, for those who have eyes to read it, more precious by far than any single work of Greek literature? To the mythologist, sculptor, architect, philologist, and historian it has opened separate fields of investigation, and from each quarter a beam of light has been shed on the whole subject of Greek civilisation. What is true of the Parthenon in this connection, for instance, is much more true of the whole architectural development from the time of Agamemnon to that of Alexander, as illustrated by the monuments, and by all that is comprehended in them—inscriptions, sculpture, and religious, civic, or domestic furniture. In this sense architecture might be called the sheet-anchor of history, which without the everlasting testimony of the monuments would certainly

become fluid and unstable. For example, the higher critics of literature in the generation now past gave Homer between them a time-period of about seven hundred years, they mostly believed his accredited work a mass of interpolations and accretions by different authors of varying dates, they had almost succeeded in casting doubt on his very existence, and discredit on the tale he told. But architectural archæology, in maintaining the historic truth of the Homeric epics, has in great measure vindicated itself as the teacher of the past.

But let us not make the mistake of depreciating in return the literary side of the study. We need them both, for how much more is open to the student who examines the architectural works with full mythological knowledge, or from the point of view of the trained philologist or historian! No exposition of the subject will appear satisfactory to one whose education has fitted him to take up a standpoint in one or other of these directions; inevitably the subject must appear as if presented in false perspective, or as if badly lighted, or carelessly drawn. Yet, even at the risk of such distortion, the scope of this sketch must be limited to that which is comprehended in the architect's point of view, though this need not mean the refusal of all historic narration, the rejection of all mythological explanation, nor the divorce of sculpture from its architectural setting. It involves rather the subservience of our programme to an architect's needs and ideals; but so rooted is the architectural purpose in the motives of the social and religious life of the Hellenes that it is believed that this point of view will give to others, who may not be specialists in any one department, a broader and swifter view of the whole subject of Greek civilisation and history than is possible by any other simple method in the same limited space. For what can tell of the Greeks more worthily than the actual buildings which the wants and ideals of their civilisation determined, their hands shaped, and their wits defined?

Yet this wider historic view is only a subsidiary purpose. Our business is to impart the lessons of architectural history in the new light, to give the architectural student a clear apprehension of the historic significance of style. Nothing is more likely to wean him from the misuse or feeble copyism of its characteristics than a grasp of their relation to surrounding circumstances. To this end, buildings will be studied in their plan and design, rather

than in their details or furnishings. Architecture, more than pottery or painted decoration, is the work of a nation, the symbol of a religion ; and the houses of gods and men are greater than the idols and ornaments thereof.

The reason why it is essential in studying architecture to have some regard for the broad views of history, religion, and society is that the purpose for which the building is erected is the greatest controlling factor in shaping that building. For example, it is really of greater importance in the evolution of Greek architecture that the Greeks devised shrines to house their gods and goddesses and for the needs of their particular ceremonies, than that marble was the building material which lay close at hand. Material is, of course, another influence, but a decidedly minor one. Temples were built of marble at Athens, and of limestone at Paestum and Corinth, the only effect upon the design being a greater refinement of detail at Athens—the type is one and the same, and the type was determined by tradition.

In what way to use tradition is the problem of modern architecture. In earlier days an architect's retrospect was bounded by the works of his grandfather, or at most by the primitive arts of his own district. But now there is this difference, that it ranges over the larger traditions of all architectural history, choosing the good and refusing the bad, and no doubt, if we but keep in touch with Nature, out of this selective use will come in the fulness of time a living art as noble as Greek, more cosmopolitan than Roman, and perfectly characteristic of the age we live in.

Progress in every department is attained only by making good use of the experience of the past, and it is more to the point that we should select and profit by the true and everlasting principles of Greek art than that we should desire to know where the Greeks came from, and who they were—matters that can never concern us practically as architects or citizens; since we cannot choose for ourselves an Hellenic pedigree. Yet this sketch would be strangely incomplete if in summarising the controlling factors of Greek art we did not take into account the origins of the Greek race and the environment which influenced the development of its civilisation.

The territory of Greece itself was, in ancient times, much as it was defined on the maps of Europe before the Balkan Wars of 1912-1913, that is, with a northern frontier including Acarnania

and Thessaly. But this territory, the part of Europe nearest to Asia Minor and Egypt, is, of all the lands bordering on the Mediterranean, more profusely indented in its configuration than any other. Thus, while in area Greece was smaller than Scotland, its coast line was much longer than that of all Great Britain. The whole country, furthermore, is a vast assemblage of high mountain peaks, much recalling, though on a grander scale, the steeper and rockier parts of the Western Highlands and Islands of Scotland. A labyrinth of land-locked bays and harbours, of wild mountain tracts and ravines, it was divided and isolated one part from the other, save for the means of communication that the sea afforded. The natural harbours lie open to the east and south, stretching out their long arms as if to invite and welcome the sailor; and the island stepping-stones fill in the great geographical design, placed as if to lure the caiques from Crete and the coasts of Asia Minor. But on the other hand we have Crete and the numerous Aegean islands, at one time the source from which came colonists to the Greek mainland, and subsequently the destination of counter-currents returning from the Greek mainland, including both fugitives seeking refuge and conquerors seeking expansion. This eastward movement gradually engulfed the shores of Asia Minor, and from that time Greece was to plant colonies around the greater part of the Mediterranean and the Black Sea. Hemeroscopion in Spain, Massilia in France, Sybaris in Southern Italy, Syracuse and Acragas in Sicily, Cyrene in North Africa, Naucratis in Egypt, Sinope in Armenia, and Olbia in Southern Russia, are but a few of the more important settlements of this wonderful people, who, while often at enmity with one another, and divided in dialect, laws, and manners, yet spoke one language, worshipped the same gods, and mingled in the same games and festivals.

Now it is not difficult for us to trace some relation between the environment of the Greek race and their expression in art. Their separation into small communities, and independent comparatively peaceful development, the necessities which drove them to a seafaring life; circumstances, also, such as the extreme brilliancy, the lightness and bracing properties of their atmosphere; the clay, fine limestone, and marble in which the soil abounded; the want of metal and other commodities which led to the necessity for traffic with other lands; these and other similar causes, it is easy now to say, produced the types of Greek art. But there

was a good deal more than this, whichever of the two great opposing views of history we take—whether we are to regard all this material provision as a preparation for the “Glory that was Greece,” or whether we are to regard that glory as a kind of accidental or fortuitous result of circumstances. Both schools would agree to put it in this way: that it was *in the race* an instinct. a tendency. an aspiration. an inspiration. Not that the Greeks any more than others were “a nation of artists”, but the instinct in the select few was revealed and matured largely because the nation prepared an atmosphere favourable to the culture of art. They knew so well how to live, their social economy was so perfect, they lived so close to Nature, in short, that they seem to have produced the highest type of the natural man which the world has yet seen.

Greek architecture might be treated from either one of two points of view, the analytical or the historical. We might, for instance, investigate first the materials and methods of construction, then the orders and other elements of design, and finally examine one by one the various classes of buildings—temples, commemorative and sepulchral monuments, administrative buildings, porticoes and markets, gymnasia and baths, theatres, private houses, and the like \*. Or we might, on the other hand, adopt a chronological treatment, dividing the field into successive epochs, examining the general characteristics of the civilisation of each period and the ways in which these gradually modified the ideals and forms of architectural expression. The latter method is more in keeping with our purpose, which is that of studying the fundamental principles of the style through the influences that shaped its evolution and growth.

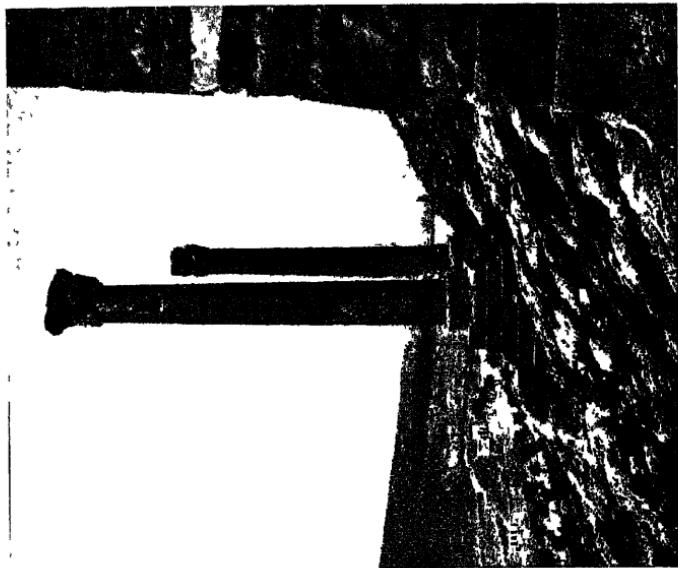
As for the subdivision into the successive periods, it happens that every style of art shows a gradual evolution, the rise, the brief culmination, and the decline. So also we may view Greek architecture in such a way as to emphasise this principle, taking as the central or culminating period that of the greatness of Athens under Pericles (about 460-400 b c). Before it lies the archaic period, the beginning of Greek political power and art, closing with a transitional stage at the epoch of the Persian Wars (600-460 b c), and after the culmination, on the other hand, we have

\* This analytical method is followed, for instance, by Borrmann, Choisy, Durm, Marquand, Stevens, and Benoit.

the fourth century with its change of ideals, the beginning of the decline (400-300 B.C.) Then we have the beginning and the end, the primitive period in which the first germs of classical Greek architecture appeared (1000-800 B.C.), and the Hellenistic and Graeco-Roman periods during which Greek culture was spread over, and contaminated by, the entire eastern Mediterranean, and so finally extinguished (300 B.C. to 300 A.D.). Each of these stages will be considered in a single chapter, with the exception of the archaic period, wherein, because of the distinct cleavage of the styles in accordance with two racial types, it is preferable to treat separately the west and the east.

But before this development lies a prelude, a separate civilisation, that of the Aegean age, and while this, too, might be traced, if we had but the time, in the same detail with successive periods, yet we may, since it is not our main subject, view it as one whole.

PLATE III.



DORIC COLUMNS OF THE TEMPLE OF POSEIDON



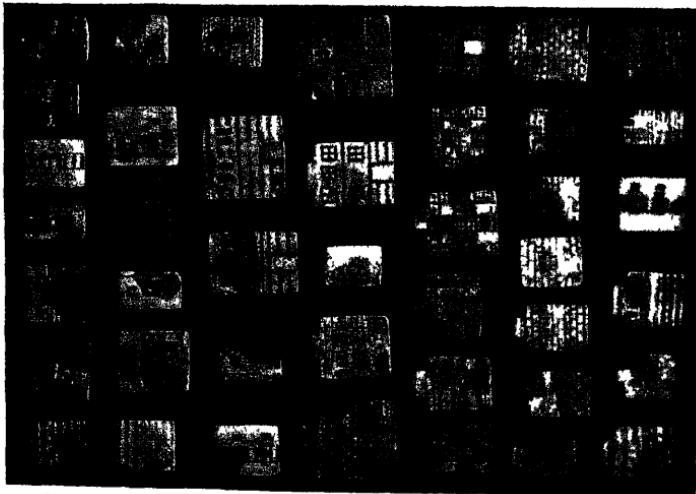
CORINTHIAN CHORAGIC COLUMNS ON THE SOUTH

PLATE IV.



FAIENCE PLATES SHOWING HOUSE-FRONTS, FROM CNOSSUS  
(CANDIA MUSEUM).

TERRA-COTTA URN REPRESENTING CLUSTER OF ROUND  
HOUSES, FROM MELOS (MUNICH MUSEUM).



## CHAPTER I

### THE AEGEAN AGE

IT is but fifty years since the history of Greek architecture entered upon a new phase by reason of the discoveries of Dr. Heinrich Schliemann at Troy, Mycenae, and Tiryns. This phase has been still further emphasised during the opening years of the present century, by the researches of Sir Arthur Evans on the island of Crete, bringing to light the remains of a palace at Cnossus, several centuries older than that which Schliemann discovered at Tiryns, and containing revelations of so early a civilisation that, as Evans says, one might imagine a new record had risen from the earth. The principal discoveries here belong to the sixteenth century B.C., but they show so high a degree of civilisation as to suggest many centuries of earlier development, while at lower levels are strata through which this development can actually be traced back to about 8000 B.C. To the drama of the history of Greece, which not so long ago opened with the scenes of the Iliad, there has thus been unfolded at one and the same time a background and a prologue. The Cretan excavations have shown that the legend of Minos and his maritime power had a solid foundation in fact.\* The richness of this prehistoric period in every kind of decorative art, to which the treasures in the Mycenaean and Minoan rooms of the Museums of Athens and Candia bear the most striking testimony, has been such as almost to overshadow, for the time, the glories of the Periclean age. It will be our aim in this chapter to gather and select out of the mass of relevant and irrelevant material published on the subject some of the principal matters of interest to the architectural student, especially those discoveries

\* Even in the first edition of this work, containing the late Mr. Anderson's lectures written in 1898, the legend of Minos was put forward as suggesting the probable connection of Crete with the earliest civilisation of Greece.

which give fuller significance to the later developments, and appear to have influenced profoundly the course of Greek architecture.

The district around Mycenae was, until twenty years ago, regarded as the centre of a civilisation called, for convenience, Mycenaean; but the discoveries in Crete have led archaeologists to the conclusion that Mycenaean art was only a local development of a much older one, extending over Crete and the whole of the area about the Aegean Sea. The broader title of Aegean may, therefore, be regarded as more suitable for the entire epoch.\*

The Aegean civilisation, however, concerns itself with two distinct races at least, the islanders and the mainlanders. The islanders were non-Greek, of that neolithic Mediterranean stock which had occupied the northern African and southern European shores for thousands of years. The mainlanders, on the other hand, were newcomers, Greeks, a branch of those Aryan peoples who were migrating westward through central Europe, sending offshoots at intervals toward the south. The stronghold of the islanders was Crete, while the mainlanders occupied continental Greece and Troy. Certain ethnological changes, and the contemporary changes of style, permit a subdivision into periods which correspond, from the standpoint of evolution, to those into which we shall subdivide classical Greek architecture. These periods may be summarised here, though the brevity with which we must consider Aegean architecture will not permit us to discuss the stylistic variations of each phase.

We meet first a primitive period characterised by the neolithic civilisation†, of which the beginnings go back, in Crete at least, to 8000 B.C., while the lower limit may be placed, both in Crete and on the mainland,‡ at about 3000 B.C., no trace of such a period has yet been found in the smaller Aegean islands. This was

\* The term Minoan is generally applied to the civilisation of Crete, Cycladic to that of the smaller Aegean islands, and quite recently the corresponding development on the mainland has been described as Helladic. In all these classifications, the epoch is minutely and somewhat mechanically divided into three periods and eight or nine sub-periods. The Thessalian culture of northern Greece is divided into only four periods. I have preferred a classification based rather on the recognised stages of artistic evolution, as suggested below.

† No palaeolithic remains have yet been found in this area. Even of the neolithic period (except in northern Greece) the architectural remains are very scanty, a notable feature is the entire absence of megalithic architecture of the kind found in western Europe.

‡ This would include Thessalian I.

followed by an archaic period, of which the initiation, at about 3000 B.C. in Crete and the other islands (which now for the first time began to play a part), was doubtless due to the infusion of a new "Armenoid" stock from Asia Minor, bringing with it copper from Syria or Cyprus, and mingling with the earlier neolithic inhabitants. This period lasted in all areas until about 2000 B.C., and was marked by the introduction of copper and the gradual evolution of bronze.\* On the mainland the period clearly falls into two halves, in the first of which the civilisation continued to be purely neolithic, developed from that which preceded it, though we meet in Eastern Thessaly an infusion of new blood in the form of a migration of the "Tripolje" culture by way of Macedonia and Bulgaria from its trans-Carpathian home, while in the second half the neolithic civilisation of southern and central Greece was partly overwhelmed by an invasion of the bronze-using islanders; Troy remained purely northern, but adopted the use of bronze. Fresh arrivals from the north, the "Minyan" invasion of about 2000 B.C. which regained the Peloponnesus for the mainlanders, backed by a fresh wave of the "Tripolje" culture which found refuge in Thessaly, fleeing before the Ukrainian tumulus-folk who now spread across Bulgaria and Thrace and north-western Asia Minor (overwhelming the second city of Troy), ushered in the transitional period (2000-1650 B.C.);† the islanders, on the other hand, retained supreme control of the sea, and in the security of Crete and the other islands developed their art to a surprising degree. The result was a period of culmination, the golden age of the Aegean civilisation (1650-1450 B.C.),‡ in which the power of Crete was at its highest, and her artistic supremacy (though probably not her political suzerainty) was accepted by the "Minyan" rulers of Mycenae and Tiryns, these northerners, however, were already beginning to undermine the Cretan empire, by seizing some of the islands, such as Melos and Paros. Later came another wave of northerners, the Achaeans, whose advent begins a period (1450-1100 B.C.) characterised by a slight decline in taste, the silver age of the

\* This is Early Minoan (Cycladic) I-III and Middle Minoan (Cycladic) I of the island systems, Thessalian II-III and Early Helladic I-III of the mainland systems of chronology.

† This is Middle Minoan (Cycladic) II-III, and in part Thessalian IV and Middle Helladic I-II.

‡ This is Late Minoan (Cycladic) I-II, Thessalian IV and Late Helladic I-II.

Aegean civilisation, corresponding to the fourth century in classical architecture,\* they, more venturesome than their predecessors, plundered and destroyed the Cretan cities (about 1400 B.C.), and even raided the coasts of Asia (Troy, about 1250 and 1193-1184 B.C.; Caria and Cyprus, 1225 B.C.) and Africa (Egypt, about 1230 and 1190 B.C.). The Achaeans thus established their political supremacy and their language, and brought the island culture to an end, but they adopted the arts of the people whom they displaced, and their reflection of Cretan art continued to develop until they in turn were overwhelmed by their own brethren, a final and ruder wave of Greek invaders, the Dorians (1104 B.C., according to the traditional dating). But for this catastrophe the evolution would have continued through further stages of decline, and indeed we have suggestions of such a decline in the (sub-Mycenaean) survivals of the Aegean culture in island fastnesses such as Aegina, and in the cities wherein the fleeing Achaeans sought refuge, as at Troy, Miletus, and on the islands of Rhodes and Cyprus.†

The centres of the Cretan civilisation were Phaestus on the south coast and its rival Cnossus on the north. At first, during the archaic period, owing to affiliations with Egypt, Phaestus seems to have been the stronger, but during the transitional period the two cities were on equal terms, Cnossus having found a means of building up an empire over the Aegean islands toward the north, and so strong did this Empire of Minos become, that in the period of the culmination Cnossus was supreme. The other Cretan cities and towns, Gournia, Malia, Mochlos, Palaikastro, Pseira, Sitia, Tylissos, and Zakro, were subject to these two main centres. Among the Aegean islands, Melos (Phylakopi) was of the greatest importance because it was the centre of the obsidian trade, and hence it was one of the first outposts to be wrested from Cnossus by the mainlanders; of less importance were Naxos and Paros.

\* This is Late Minoan (Cycladic, Helladic) III, with the end of Late Minoan (Cycladic, Helladic) II.

† The chronology of the Aegean age is still in a state of fluctuation, since every new excavation affords fresh evidence and alters the perspective. See, in general, Bury, *History of Greece* (new ed. 1924), pp. 6-84; Hall (H. R.), *Ancient History of the Near East* (3rd ed. 1916), pp. 31-72; Wace (A. J. B.), in Whibley, *Companion to Greek Studies* (3rd ed. 1916), pp. 23-34; Harland, *Harvard Studies*, xxxiv, 1923, pp. 1-62; Wace and others in the *Cambridge Ancient History*, I (1923), especially pp. 92-93, 103-106, 136-142, 173-180, 589-615, II (1924), pp. 28-31, 285-290, 431-517.

(which then shared a monopoly in marble), Seriphos and Siphnos (the centres for various minerals), Syra and Thera. The distant island of Cyprus, south-east of Asia Minor, on the fringe of the Aegean area, was one of the richest districts because of its control of the copper market. Likewise Troy (Hissarlik), at the north-west corner of Asia Minor, though lying at the very edge of the Aegean area, rose to special prominence because of its commanding position at the entrance to the Black Sea, in a region of silver mines, nine successive settlements ranging in date from the primitive village of about 3000 B.C. at the bottom to the Roman city of Ilium at the top—six of them destroyed during the Aegean period—bear witness to the jealousies and struggles of its neighbours to secure this lucrative position. On the Greek mainland, held partly by the uncultured northerners and partly by weak outposts of the islanders, many centuries elapsed before any site was able to rival the splendours of Crete, Cyprus, and Troy. The Thessalian settlements (Dimini, Rakhmani, Rini, Sesklo, Tsangli), those of central Greece (Chalia opposite Chalcis, Hagia Marina in Phocis, Lianokladi, Orchomenus, Thebes), of Attica (Athens, Eleusis, Menidi, Spata, Thoricus), Thermum in the far west, the Argive group (Argos, the Argive Heraeum, Asine, Midea, Mycenae, Nauplia, Tiryns, Zygouries, Korakou and its neighbours near Corinth), the other Peloponnesian centres (Sparta, Messenian Pylos, Triphylian Pylos or Kakovatos, Olympia), and the Ionian islands (Cephallenia, Leucas), were, in comparison, mere villages. But from their number developed the centres of the last phase, the silver age, of the Aegean civilisation—the twin rulers of the Argive plain, Mycenae and Tiryns; the twin guardians of the Copaic lake, Gla and Orchomenus, Thebes, the city of Cadmus; and, last and least important, the city of Theseus, Athens.

Before we begin the study of the monumental structures, we may well take account of certain valuable evidence presented by remains of a more humble and elementary character, the houses of the people. For it was always from the private houses that was developed the dominant architectural type in which the history of each epoch can be most easily traced.

The private houses differed according to the racial characteristics of the inhabitants, that is, Mediterranean “Cretans” or Aryan

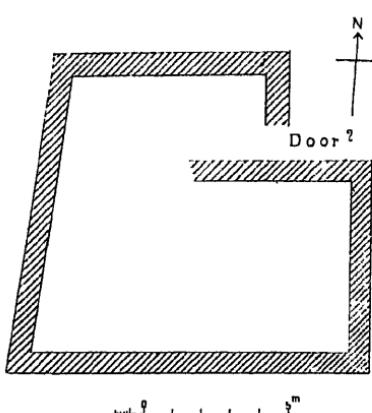


FIG. 1.—NEOLITHIC HOUSE AT MAGASA, CRETE

in general they may be regarded as fundamentally separate architectural styles.

The Cretans, at a period long antedating the earliest remains of their houses, had lost all recollection of a nomadic state and of the circular nomadic hut, unless we are to suppose that the few early circular tombs (dated between 2700 and 2000 B.C.) dimly reflect such a tradition. The houses themselves, and most of the tombs (which reflect house forms), were rectangular from the very beginning (Fig. 1),\* a typical form is the so-called "but and ben" scheme of two rooms, an outer living room and an inner bedroom. As the civilisation became more advanced, the houses began to contain additional rooms, spreading over larger areas; and since in such complex plans it was impossible to provide outside light in all cases, central courts, and even additional light wells, made their appearance. The tendency was to use wide but shallow units, with two or more doorways in the longer wall of the rectangle. In the more pretentious houses, even as early as 2000 B.C., wooden columns were employed to permit deeper rooms; and when these occurred in an upper storey, they were supported on square stone piers in the lower storey. Such complicated and irregular plans could not have originated if the roofs had not been flat, as was generally the case among the southern peoples; and the flat roof,

Greeks Among the former we find the southern type of house, rectangular, shallow and wide, with a terraced flat roof. On the Greek mainland we find the northern type, originally of circular or horse-shoe plan, eventually rectangular, but always deep and narrow, with a sloping roof. The differing elements later intermingled to a slight extent, as the Cretan civilisation was imported or imitated on the mainland, or when the Achaeans Greeks subsequently invaded Crete; but

\* Possible neolithic examples occur at Magasa and Trypiti.

in turn, suggested the superposition of an additional storey, and the insertion of stairways. In the towns, where the areas were more restricted, the houses seem to have compensated for this in height, the small faience plaques found at Cnossus (Plate IV) show houses in two or even three storeys with flat terrace roofs and small roof attics above the stairways to the terraces, all dating from before 1700 B.C., the ground storey is blank except for one or two doorways symmetrically placed; the upper storeys show windows framed in timber, containing two, four, or six panes subdivided by mullions and transomes. The lower portions of the walls were of rubble, the upper parts of sun-dried bricks framed in wooden beams set both horizontally and vertically, the whole covered with rough lime plaster, the latter, in turn, might be coated with red wash, or the decorations might emphasise the form of the half-timbered construction of the walls, with horizontal tie beams and the round ends of floor and roof beams.

The type of rectangular house, with local variations, migrated with the Cretans to the other islands and the mainland. Thus we find it in the first settlement at Phylakopi (Melos), before 2000 B.C. A little later, before the eruption of 1600 B.C., the houses of Thera were being erected of irregular blocks of lava, bonded with branches and logs of olive wood, roofed with a layer of earth and stones one foot in thickness, supported on wooden beams; wooden columns or stone piers were employed when intermediate supports were necessary, doorways and windows were spanned, not by wooden lintels, but by corbelled stones. Such island forms came to the mainland after 2500 B.C.; at Zygouries, south of Corinth, are small rectangular houses with flat roofs and very irregular plans, though generally there was one main chamber of square plan in each house, very different from the northern megaron. A more inexplicable instance of the spread of the southern type on the mainland occurs at Tsangli (Thessaly), where the houses are square, each wall with two internal buttresses, while one house has also a row of four interior columns in the centre, dating from the primitive (neolithic) period, the construction consisted of low stone foundations or sills, on which the walls were carried up in sun-dried brick.

On the Greek mainland, however, the normal form of the earliest houses was the circular hut common to all nomadic peoples, the most developed forms, with circular sills composed of flat stones on which were reared beehive domes, first of wattle-and-daub and then

of sun-dried brick, are to be found at Orchomenus in Boeotia (Fig. 2)\* and at Sesklo in Thessaly. On account of the difficulties of domical construction and the inconvenience of living in such houses, the

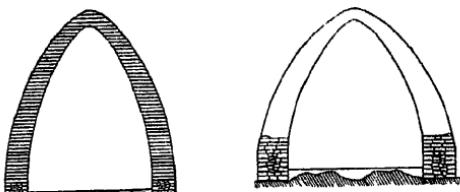


FIG. 2.—SECTIONS OF CIRCULAR HUTS AT ORCHOMENUS  
(Restored by Bulle)

walls were sometimes made vertical, and were covered by a low conical roof made of reeds, leaves and mud, as we see it represented in an urn from Amorgos. Such a house might be enlarged by the juxtaposition of two or more circular huts (Plate IV),† and when these were eventually connected by walls the result was the elliptical plan found at Olympia. Such elliptical huts might in turn be joined together, two at right angles in the form of a letter L, as at Thermum; and it is interesting to note that in these examples the curving vaulted roofs were still retained. But it was more usual to obtain separate rooms by subdividing the ellipse, using internal partitions as at Rini in Thessaly, and at Sitiá in Crete (a northern importation).‡ The next step was the opening of the entrance, giving the horseshoe or hairpin plan, short or long, observable at Olympia, Orchomenus, and elsewhere. The gradual straightening of the walls until the sides became parallel, with a façade wall at right angles containing the doorway, marks the beginning of the rectangular plan, the entrance, as determined by the open mouth of the horseshoe, remained at the square end opposite the apse. Interior cross walls, parallel to the façade, in effect form a rectangular plan with the apse attached (Fig. 3), as in examples at Paros, Rakhmani (Thessaly), Thermum and Korakou (Corinth). The apse then formed a sleeping chamber, the *thalamus*, and gradually the front portion was

\* The two examples shown are about 25-26 feet in external diameter.

† The urn from Melos is a representation of seven of these circular huts grouped round three sides of a central court, of which the fourth side is closed by a wall with an entrance porch.

‡ The example at Sitiá, apart from its elliptical outline, is thoroughly Cretan, with a central light court, it is of great size (46 by 74 feet in plan), and dates from about 2000 B.C.

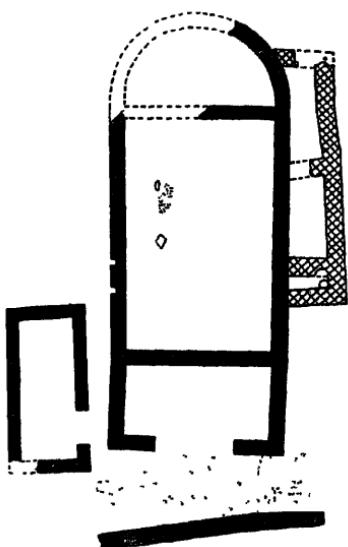


FIG. 3.—APSIDAL HOUSE AT KORAKOU, CORINTH

cut off to form a porch or prodomus. As the plans became elongated, we must suppose that the roof, retaining its traditional pitched form—or, as at Thermum, pointed vaulted section—acquired a horizontal ridge, shedding rainwater toward either side and probably also toward front and back;\* the open porch on the façade must have had a horizontal lintel resting on the antae or thickened ends of the lateral walls, and above it we are probably to restore, not a gable, but horizontal eaves, with a low hipped roof.

The next step was the straightening of the apse, which became segmental at Rakhmani, polygonal at Lianokladi (both in

Thessaly), until eventually it was made perfectly straight, so that the rear room, and with it the entire plan, became wholly rectangular; the entrance remained, however, at one of the narrow ends. The resulting plan (unless, as sometimes happened, the thalamus was in a separate building) was a rectangle of three compartments, the central one being the largest; in the middle of this main compartment was the hearth, which was the centre of social intercourse and hospitality, our traditions of the fireside, the hearth and the home, thus go back to the beginning of European civilisation in Greece. Such plans appear, for instance, in the Second and Sixth Cities of Troy (the walls in the latter being of hewn stone),† and in the Second and Third Cities at Melos (which after 1650 B.C. seems to have been a mainland outpost). Probably at this time the ridge roof began to be terminated by gables at both ends;‡ Further

\* A flat terrace roof would hardly be logical with the circular or even with the apsidal plan.

† Unfortunately the house plans of the First City of Troy are still unknown.

‡ It is often assumed that the roofs of these buildings, especially those of more monumental character, were flat. But apart from the racial characteristics of this northern people, we have certain specific evidence, such as the

developments consisted in the widening of the plan, which necessitated the introduction of intermediate supports, a row of columns or posts along the central axis of the rectangle (Fig. 4), sustaining, not the ridge-pole,\* but the horizontal ceiling beams running from

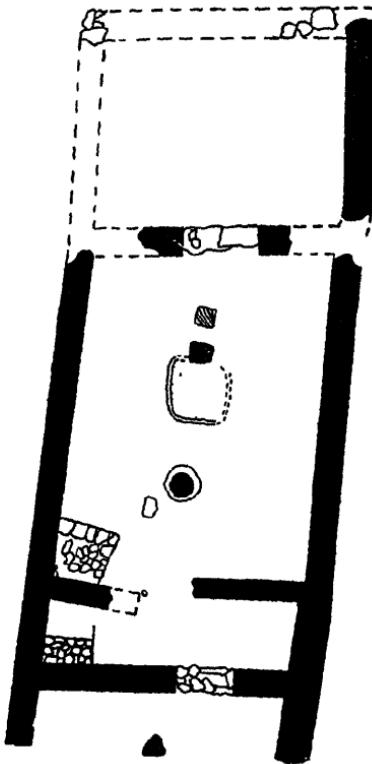


FIG. 4.—RECTANGULAR HOUSE AT KORAKOU, CORINTH.

side to side. The posts were of wood, resting on stone bases ; there might be two or more in the great hall, and one at the centre of the façade of the prodomus between the antae or in-antis, as at Korakou (Corinth) and in the Sixth City of Troy (where the main chamber

urn from Melos, an intaglio from Mycenae, the roof sections of rock-cut tombs at Mycenae, Nauplia, and Spata, and masses of clay and leaves from sloping roofs at Mycenae, Sesklo and Troy, to show that they sloped to a central ridge.

\* The opinion that such single lines of supports rose to the ridge-pole is controverted by the temple at Neandria.

measures  $27\frac{1}{2}$  by 50 feet).<sup>\*</sup> When even greater width was desired, two rows of intermediate supports were used, but never more than two, and with two columns in the width it was obviously a question of supporting a transverse ceiling girder rather than a longitudinal ridge-pole; such forms, showing on the façade two columns between antae, occur at Dimini and Sesklo (Thessaly). This stage gives us the fully developed megaron type of the Greek mainland †

We are now prepared to investigate the more monumental structures for which the private houses served as models, namely, the palaces. The latter are, as it happens, the most important works of the Aegean civilisation. Just as the course of classical Greek architecture is most apparent in the development of one type of building, the temple, so that of primitive Greece is best examined in the characteristic structure of the period, the palace. The Aegean king, furthermore, was the predecessor of the Greek god. Not only were the palace and the temple respectively the supreme productions of the two epochs, but we have abundant literary and monumental evidence that the Greek temple, if not the lineal descendant of the Mycenaean palace, at least had an ancestry in common.

Of the palaces there are, again, two leading types, corresponding to the two phases of the Aegean civilisation, the Cretan (island) and the Mycenaean (mainland). In Crete we have two important examples, the palace at Cnossus already mentioned, and a second but smaller palace excavated by the Italians at Phaestus. On the Greek mainland, again, there are two examples of exceptional importance, the palaces of Mycenae and Tiryns. These types are easily distinguishable in the planning and arrangement of their component parts.

The palace at Cnossus (Fig. 5), of which the principal part of the plan was recovered by Evans in 1900-1905, measured about 400 feet each way, and was built on an eminence round a court

\* This example at Troy is sometimes wrongly explained as a temple.

† On account of the successive waves of northern tribes, each arriving with traditions of the nomadic hut which their predecessors had forgotten, we find the evolution from circular to rectangular house several times repeated. Thus in the period before 2000 B.C. we can trace the complete evolution from circle to rectangle, while between 2000 and 1450 B.C. we retrace the evolution from ellipse to rectangle in the hands of the "Minyans", the Achaeans undoubtedly brought the same traditions, reflected in their beehive tombs, and when Greece fell into the hands of the Dorians we once more revert to the horseshoe plan.

200 feet long by 86 feet wide, running nearly north and south ; the total area is more than six acres. On the south and west sides were the principal Halls of State and the King's Entrance , on the east side was the private residence of the king and queen, which, built on the slope of the hill, occupied a lower level ; and at the north end was the chief entrance to the court and the offices

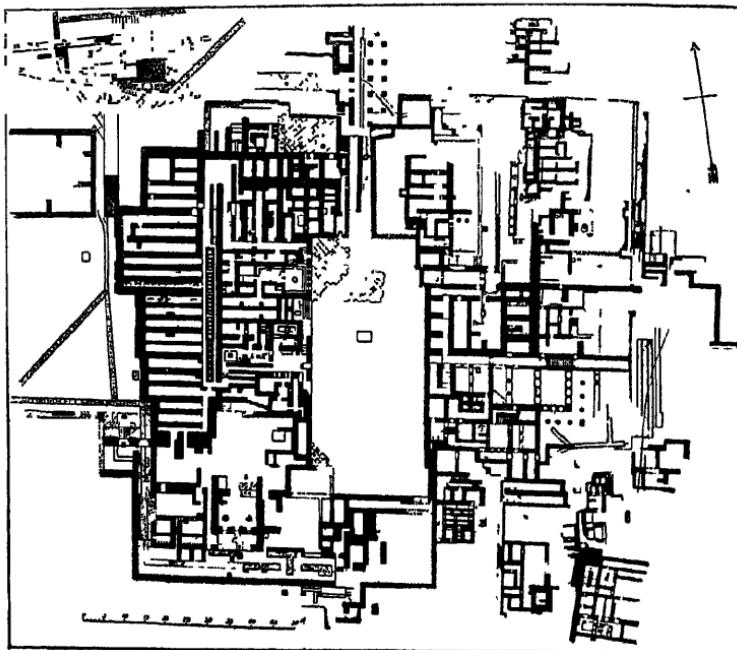


FIG 5.—PLAN OF THE PALACE AT CNOSSUS

The entrance from the open space on the west, which may be regarded as the Agora, seems to have been left quite unprotected , whilst on the east side the private residence opened on gardens or terraces, probably sheltered and made more private by trees, but enclosed by little more than a garden wall, with a single bastion Almost the only means of defence at Cnossus would appear to have been a tower or bastion at the north, commanding the main road from the city and port At the south descended a great stairway to a stone platform, whence a bridge crossed the ravine and led to the road southward to Phaestus

Although at first sight the plan with its great central court and main entrance at the north end, and the walls all built at right angles to one another, would suggest its having been set out symmetrically or on a well considered program, yet further study shows that it varies widely from the principles of symmetry and axial planning. The walls of the west front jut out into the western court at varying distances, in the central court there are projecting blocks at the north-east and south-west corners. The northern entrance passage is not quite in the axis of the central court; the great corridor of the east wing is very nearly on the transverse axis of the court, but there is no corresponding feature at the west.

The walls of the western wing of the palace, as now existing, consist only of a basement about 8 feet in height, the floor of which is a little below the level of the central court. With the exception of one hall, to which the title of "throne room" has been given, there are no architectural features in this basement storey which it is necessary here to discuss. The wing consists chiefly of an endless series of storerooms and magazines, which in their solid masonry and general construction were far superior to that of the ephemeral materials of which the upper floors were built, and therefore permit us to make a conjectural restoration of the main floor.

The secondary state entrance was in the south-east corner of the west court, through a portico of one column in-antis, the Cretan architects generally preferred to use one column as an intermediate support (if the span were not too great), rather than to encumber the entrance with two columns. From this, at one side of a guard room, opened a corridor 10 feet wide, its walls decorated with paintings representing a state procession. This corridor led southward to a terrace 28 feet wide and extending along the southern edge of the palace for a distance of 185 feet, it was probably covered with a roof supported by two rows of columns, the ground outside the palace was at this point about 10 or 12 feet below the level of the terrace. It is possible that one or more passages led north from this terrace to the central court, but greater emphasis was laid on a passage of which the axis lay only 85 feet from the west end of the terrace, a propylon the façade of which seems to have consisted of one column in-antis, while the wall behind was pierced with three doorways. North

of this cross wall the passage continued for 41 feet between flank walls 30 feet apart, as this was too great a span to be roofed conveniently without intermediate supports, we may suppose that it was subdivided into three aisles by two lines of columns, five in each row, the two column bases nearest the cross wall having actually been found. Beyond this again was an open court, called the Court of the Altar, the stone base of an altar having been found in a rectangular recess on the right. The level of the state apartments was about 5 feet above the court, and was presumably attained by a flight of stone steps (of which all traces are now gone) just opposite the propylon, leading up to a portico. The great halls on this upper level have all perished, so that it was only by the most minute examination of the upper parts of the remaining walls that Evans was enabled to suggest a possible plan, with the assistance afforded by the parallel in the palace at Phaestus. Under these conditions, however, the restoration must be largely conjectural; and that usually suggested, with the audience hall forming a compartment only 24 feet deep and 36 feet wide immediately behind the portico, seems hardly in accordance with the usual scale and magnificence of such halls. Rather should we restore an inner vestibule just behind the portico, its ceiling supported by columns, and met at right angles by a monumental corridor 16 feet wide, approached by a flight of steps from the central court. According to this hypothesis, the audience hall would be the great compartment about 42 feet deep and 48 feet wide overlooking the west court, its roof supported by two columns, for which heavy piers were carried down through the basement magazines. In these Cretan halls, placed in upper storeys, there was no fixed hearth such as we shall find in those placed on the ground level in the mainland palaces.

The only other hall in the west wing which it is necessary here to describe is that known as the "throne room" on the lower floor (Plate V). Through four doorways between piers facing the central court one descends five steps to an anteroom, and thence through two doorways enters a room measuring 20 feet long by 12½ feet wide, in the centre of which, against the wall on the right-hand side, is an alabaster seat with a high back of very unusual design; flanking this seat on either side is a low bench running along the wall and returning at one end, while the wall above was frescoed with reclining chimaeras guarding the seat of honour.



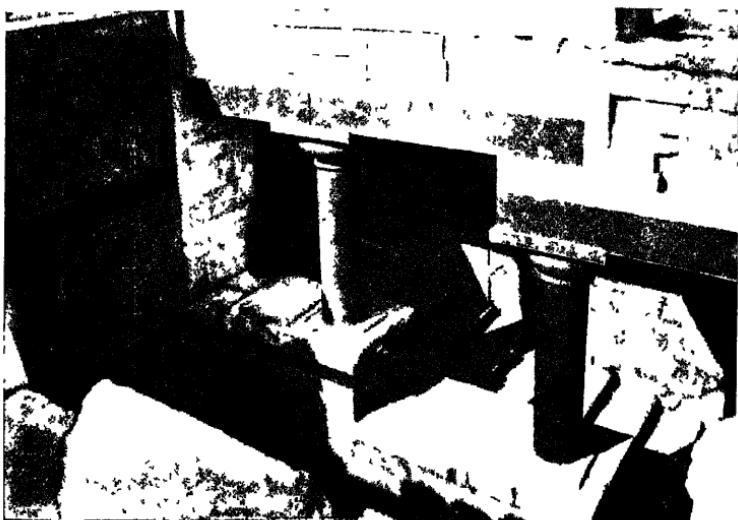
THRONE ROOM AT CNOSSUS, WITH FRESCOES PARTLY RESTORED.



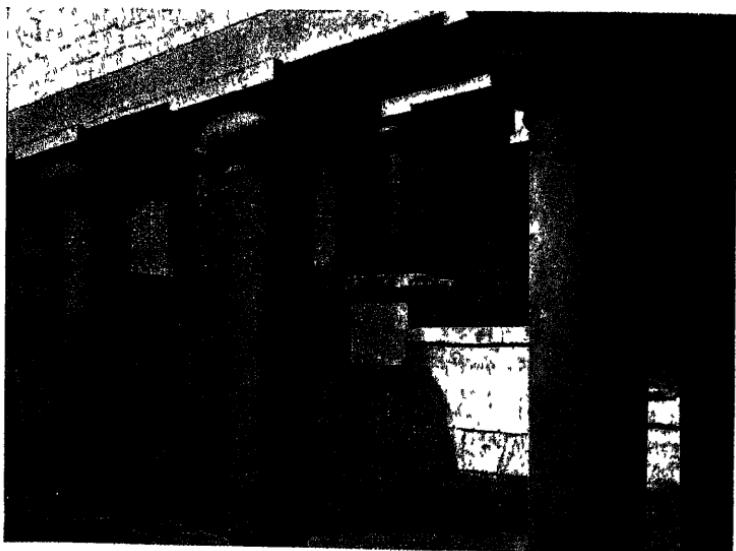
ALABASTER FRIEZE FROM CNOSSUS.



COLUMN WITH BRACKET  
CAPITAL ON STONE  
RHYTON  
FROM HAGIA TRIADA.  
(CANDIA MUSEUM.)



UPPER PART OF GREAT STAIRCASE AT CNOSSUS.



BOTTOM OF GREAT STAIRCASE AND LIGHT-SHAFT AT CNOSSUS.

Opposite the throne is an open court or light well, the floor sunk about two feet below the level of the throne room and approached by six steps ; this area was divided from the throne room by a low parapet with columns in timber, for which sockets were sunk into the parapet and into the stone bench before it.\*

Coming now to the eastern wing of the palace, the floor of the north half, about  $13\frac{1}{2}$  feet below that of the central court, must be regarded as a basement, there being no halls or residential rooms in it. Over it was a great hall at a level slightly below that of the central court ; one evidently descended from the central court to a portico, behind which lay an anteroom and a great hall with a row of columns across the centre. This hall was almost symmetrical, with the audience hall in the upper storey of the west wing, and its rear wall likewise formed, at this high level, part of the outer wall of the palace.

The most interesting portion of the whole palace, however, is the south-east block, because here we find the actual living rooms of the Minoan king and queen (Fig. 6). Its preservation is due to the fact that it was built at a level so much (about  $27\frac{1}{2}$  feet) below that of the central court that it was buried by the falling in of the superstructure. Here the plan of the main group of apartments was reproduced on two, and in part on three superposed storeys, all having the same monumental character. The main hall—about 26 feet wide and 19 feet deep—is lighted from a court at its inner end, while the outer end, in the two lower storeys at least, opens through four doorways into a second chamber of the same width but only  $17\frac{1}{2}$  feet in depth. The latter room had no fewer than eleven doorways, the four mentioned above and seven others leading out to a peristyle which surrounded two adjacent sides of the room, thus three sides of the outer room were composed solely of doorways and their intervening jambs (the doors being hung on pivots which revolved in sockets in threshold and lintel, so that they could be folded back into the reveals), and thus could be thrown entirely open either to the inner room or to the peristyle outside. Beyond

\* The exact purpose of the sunken area has been disputed, and it is sometimes regarded as a tank for a bath, though no outlet is provided, so that it could only have been used in connection with a terra-cotta tub, it is, furthermore, only one of several examples scattered through the palace, and others occur at Phaestus. The plan of the "throne room," with its throne, bench, and tank, resembles a hall of initiation dedicated to Men Ascaenus and a Mother Goddess near Antioch in Pisidia, so that likewise at Knossus it may have been a hall of religious ceremonial.

the peristyle, in turn, lay a terrace about 49<sup>1</sup>/<sub>2</sub> feet wide, overlooking the valley; and other narrow terraces projected at lower levels

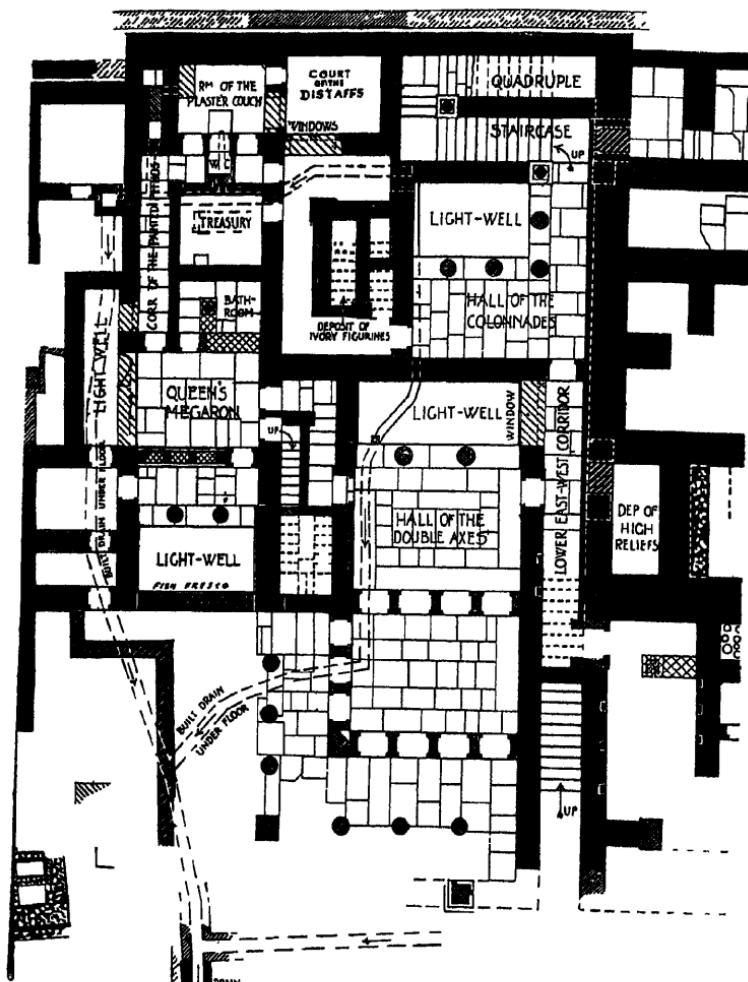


FIG. 6—DETAIL PLAN OF THE DOMESTIC QUARTER AT CNOSSUS.

until the natural slope of the hill was reached at a point fifty feet below the level of the central court.

Other rooms of similar character but on a smaller scale lie south

of those described above, and in immediate connection with them by means of circuitous corridors and winding stairways; these smaller rooms therefore probably formed the queen's suite, a suggestion which is confirmed by their strict isolation. The main room is only  $19\frac{1}{2}$  feet wide and  $14\frac{1}{2}$  feet deep, it opens eastward, by means of a doorway and three windows, to a shallow portico, and this in turn, though it might have opened directly upon the broad terrace, is nevertheless shut off from the outer world by a solid wall enclosing a light court with a frescoed landscape to alleviate confinement. The walls of the main room consist, as in the king's suite, almost entirely of openings; there are five doorways and seven windows. At the east is the above-mentioned portico with the light court, at the south is another light well, at the north are doorways to a corridor and a stairway, and at the west is a bathroom which borrows light through a window and a doorway, and a corridor which leads to a retiring room containing a plaster or stone couch, with a toilet room adjoining. The suite likewise is reproduced almost without change in the upper storeys.

On the north side of the king's suite is a straight corridor running across the entire east wing, its inner end, toward the central court, being lighted by a court surrounded by columns 11 feet 2 inches in height (Plate VI), and giving access to a stone staircase, with return flights leading up through three storeys and reaching above the level of the central court. The flights are 6 feet wide, with a central wall newel 3 feet thick, which allows of three steps on the return between the landings; each run contains twelve steps, so that there were twenty-seven steps in each storey—eighty-one in all—besides an additional landing at the very bottom. The steps have a rise of  $5\frac{1}{2}$  inches and a tread of 18 inches, and consist of solid slabs of gypsum, finished on the bottoms where they formed the roof of the flight below, and built seven inches into the wall on either side. Light is borrowed from the small court, the wall enclosing the staircase on this side consisting almost entirely of open colonnades rising parallel to the steps, so that the masonry is carried by wooden columns and lintels (Plate VI), a fact which materially increased the difficulty of its preservation. The recovery of this staircase, as Sir Arthur Evans remarks, "is probably unparalleled in the history of excavation, flights of stairs one above another being unknown even in Pompeii."

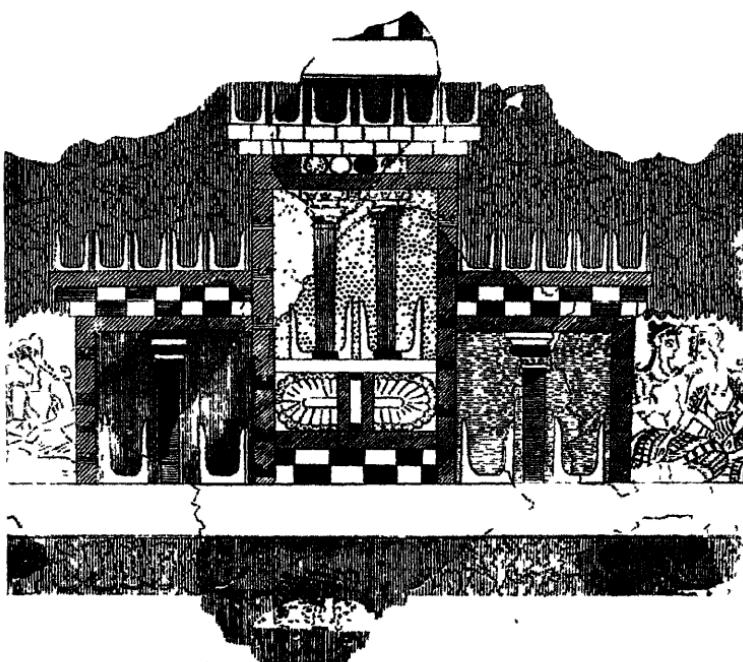
One of the most interesting adjuncts of the palace is the theatrical area at the north-west, with low step-like seats enframing a rectangular area which apparently served for ceremonies, pageants, or sports. An attempt has even been made to bring it into connection with the bull-fights which are so frequently represented on the frescoes of the Aegean age, and which may have been the source of the legendary Minotaur supposed to have inhabited the labyrinth—the palace of Cnossus \*. But we must assume that the bull-fights were held elsewhere, the theatrical area was not designed to protect spectators of this dangerous sport.

The existing portions of the walls consist of gypsum or limestone blocks, forming merely a dado; the upper parts were built of unburnt brick† or rubble masonry with clay mortar and enclosed in timber framing; this ephemeral construction was protected by stucco on which painted patterns repeated the structure of the wall behind, the painted representations of timbers even imitating the wood graining with all its knots. Other paintings and porcelain tablets (Plate IV) found in the ruins suggest that the crowning feature of the wall, represented by circular disks or decorative rosaces, may have symbolised the ends of logs of wood supporting the roof. Among other valuable architectural discoveries are the stone bases of columns found in various parts of the palace, flat disks like truncated cones, the earlier examples fairly high (up to 18 inches), carved in party-coloured stones and resembling Egyptian models, the later very low (about 2 or 3 inches). Still more important is the fact that from charred ends in the "throne room," and impressed moulds in other places, it was possible to reproduce even some of the column shafts, which were of cypress wood (Plate VI). For the capitals, which must likewise have been of wood, it was necessary to depend upon the representations of columns in small objects, such as carved ivories, and especially on what is called the "Temple fresco," a painting which had adorned one of the walls (Plate VII).

The capitals thus restored combined several members: at the bottom was an astragal between two fillets, above which came a

\* It may be noted that labyrinths or mazes figure among the designs on the frescoes of Cnossus.

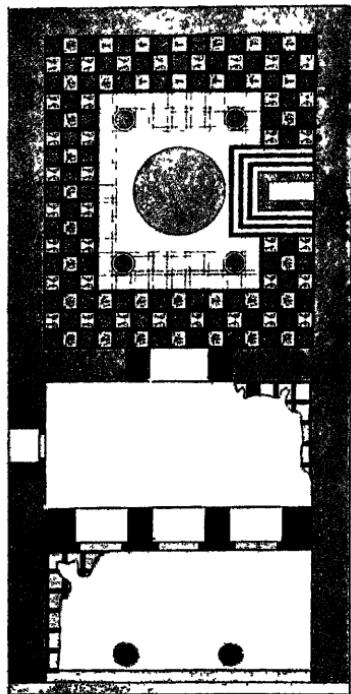
† Baked bricks have been reported from Gournia, Palaikastro, and Zakro; but it seems probable that the baking was merely the result of the conflagration which destroyed the houses.



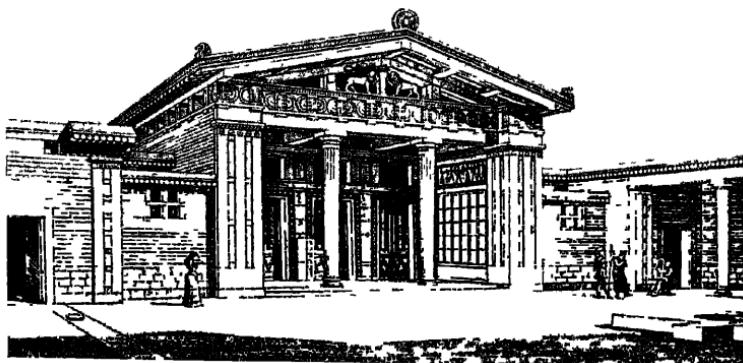
SO-CALLED TEMPLE FRESCO FROM CNOSSUS (CANDIA MUSEUM).



THEATRAL AREA IN THE PALACE AT PHAESTUS.



PLAN OF THE MEGARON AT TIRYNS.



THE MEGARON AT TIRYNS (RESTORED BY REBER).

necking in the form of a hollow, then a full spreading echinus, sometimes terminated by another hollow to separate it more distinctly from the square abacus at the top \* The abacus had a great projection ; in the staircase court, where it had to carry the superstructure and the cross beams of the upper floor, it was 3 feet 5 inches square. The shaft of the column, furthermore, tapers downward, the diminution being about one-seventh. It would seem that the Cretan architects recognised that the trunk of a tree was capable of carrying weight, whether in its natural position or inverted, and that when employed in the latter position the rain would more readily fall off it, and thus preserve it better , it had the further advantage that, with its greater diameter at the top, an increased support was given to the abacus † But other columns (Plate V), of which no monumental remains have been found,‡ being known only from representations on stone vases and wall paintings, tapered in the opposite direction, diminishing upward, and hence were probably constructed of bricks or rubble They were crowned by rectangular bracket shaped capitals, suggestive as the forerunners of the Ionic capital ; though the Aegean peoples seem never to have taken the next step, the adornment of these brackets with spiral scrolls or volutes, in spite of the fact that Egyptian ornaments, identical with those which afterwards formed the prototypes of the Ionic capital, were even then being imported into Crete and Mycenae.§ And as the most interesting decorative feature may be noted the so-called "triglyph frieze" (Plate V), similar to examples found at Mycenae and Tiryns (Plate VIII) but frequently used in Crete to adorn the faces of benches ||

\* The button-like metal projections from the hollows, shown in the paintings and sometimes interpreted as double axes, were intended for the attachment of hangings or awnings

† Such downward tapering columns were independently evolved in the megalithic architecture of the west Thus in an elliptical grotto at Telati de Dalt, in the Balearic Islands, the roof slabs are supported on a central column of which the capital, a cushion shaped block 1 $\frac{1}{4}$  feet high and 5 feet in diameter, rests upon a shaft only 4 feet high, 2 feet 1 inch in diameter at the top and only 1 foot 7 inches at the bottom

‡ Outside the Aegean area, however, some limestone examples, with cubical capitals decorated with disks and double-axes, have recently been found at Baeza in Spain, used as second-hand building material in a Roman bathing establishment (*Rev Arch XXIII, 1926, p 280*)

§ Cf the carved ivory tusk from Mycenae (Athens Museum, No 2916)

|| The assumption that this motive is the ancestor of the Greek Doric triglyph frieze is hardly tenable

The palace at Phaestus (Fig. 7), excavated by the Italians in 1900-1907, resembles that at Cnossus in the orientation with the long axis of the court running north and south, in the grouping of the rooms round this central court, in the details of the planning of the rooms themselves, in the presence of an open west court with the theatrical area, and in the secondary entrance, through a small propylon with a single column between antae, at the southern end of the west court. Probably the main approach, now lost, was at the south. The outer limits of the palace are not yet very well defined, except on the west, but its greatest dimensions would seem to have been about 350 feet by 400 feet, so that it was practically as large as its rival at Cnossus. The dimensions of the central court, 73 feet by 153 feet, are slightly smaller; but on the other hand the use of open porticoes on both long sides, columns alternating with square piers, gives it a more monumental appearance. At Phaestus, furthermore, the arrangements of the public rooms are more easily discerned. A flight of twelve steps (Plate VII), 46 feet wide, leads up from a terrace overlooking the theatrical area to a great propylon or propylaeum, of which the outer portico has one column in-antis, while the inner portico has three, facing upon a light court. From this inner portico lateral doorways gave access, on the one hand, to a stairway leading to an upper storey, and on the other to the audience hall which, as at Cnossus, was above the level of the main court, with its back overlooking the west court. A small stairway beyond the small light court descends to the portico of the great central court. Under the audience hall were magazines, not as at Cnossus all on one side of a long corridor, but short and symmetrically placed on either side of a central corridor. This symmetrical arrangement facilitates the restoration of the great rooms above, the portico, the ante-room, and the audience hall. The private quarters, which at Cnossus are found on the lower levels to the east, are here built on the higher levels toward the north. But, apart from this variation to fit the site, we have the same general arrangement of the rooms, such as the hall with four sets of folding doors in each of two adjoining walls, giving access on one side to a small portico facing upon a light court, and on the other to a larger portico facing the exterior. A different feature however is the greater prevalence of peristyle courts; not only is the central court lined with porticoes on two sides, but there is a smaller square

peristyle court at the north, and there are remains of another at the east.

The palaces described above, however, were those of the period of culmination, about 1650-1450 B.C.; both were preceded by more rudimentary structures, of which we can trace several stages, dating from their foundation at the beginning of the transitional period, about 2000 B.C. Thus the great court then occupied its

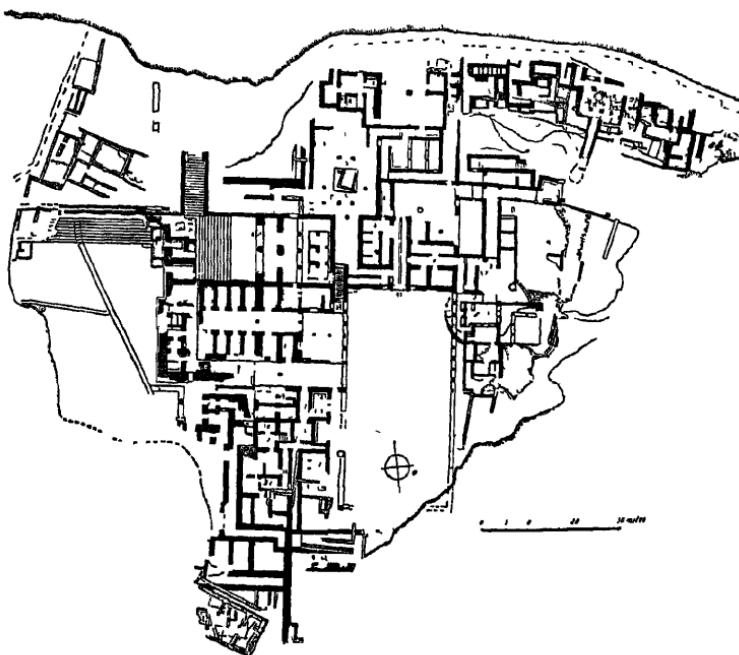


FIG. 7.—PLAN OF THE PALACE AT PHAESTUS

present position, though at Cnossus the area was slightly greater; and it was entirely surrounded by isolated blocks of buildings (at Cnossus ten or eleven) devoted to various purposes—public offices, private quarters, workshops, shrines and magazines, with narrow streets leading between them to the court or public square. It was the gradual linking together of these separate blocks, the roofing of the passages to form corridors, and the various alterations of the internal arrangements of the blocks, that gave us the palaces which we see to-day. This consolidation took place at about

1800 B.C., but the internal alterations were more gradual. Thus at Cnossus, the great cutting for the domestic quarters on the east, replacing the graded terraces by a sudden descent of two storeys from the great court, dates from about 1800 B.C., as do the grand stairway and the very elaborate drainage system, but the other rooms of this quarter were remodelled at about 1650 B.C., and the so-called "throne room" in the west wing is an alteration of even later date. At Phaestus the same process can be traced, though here the differences between the transitional plan and the final structure are even greater, some of the older rooms, such as those buried in the west terrace (overlooking the theatrical area) being quite outside the area of the final palace.

But there are, both at Phaestus and at Cnossus, relics of even earlier date, fragments of walls now unintelligible, belonging to palaces of about 2250 B.C. With these, at Cnossus, are associated subterranean chambers of uncertain purpose. The one which has been excavated is circular, domed and somewhat bottle-shaped, the diameter at the bottom being 27 feet, while higher up it is 34 feet, and the height from floor to crown of vault is 46½ feet. To it descends a curved stairway in a vaulted tunnel, winding about half of the circumference of the chamber, with arched openings through which artificial light in the chamber itself would illuminate the stairway.

Similar traits are displayed in the less pretentious Cretan palaces at Tylissos, Malia, and Gournia. The small summer palace near Phaestus, at the spot called Hagia Triada, follows a less formal plan, the scheme being that of two wings at right angles. Of special interest on account of their unusual details are the "little palace" at Cnossus, connected with the great palace by a paved walk, and the "royal villa" to the north-west, with a reception hall of basilican plan, and wooden columns of which the shafts were still preserved, reeded rather than fluted, and tapering downward.

When we turn to the Greek mainland, and to the other areas which came under the sway of the northerners, we find very different characteristics, corresponding to the fundamental differences between the two types of private houses.

The citadel of Tiryns is described in Greek literature as "the elder sister of Mycenae," and it is from the ruins of its citadel palace that we best learn the character of the fortifications and

royal dwellings of the Heroic Age in Achaean Greece. But before we describe the final form of the palace which crowned its acropolis, we may note the traces of a much earlier building on the same site, though at a lower level, discovered during the German supplementary excavations in 1912. It is a great circular structure built on a platform 91 feet in diameter, the walls are constructed in two shells connected by ribs, with a total thickness of 13 feet, and are strengthened externally by a series of buttresses arranged like the cogs of a wheel; the clear diameter of the interior was thus only 46 feet. The lower portion of the construction was of stone, the upper part of sun-dried brick. It would seem as if this were a magnified beehive hut, one suited to the dignity of the chief of a newly arrived nomadic people; and all round it the crest of the hill was covered with the less imposing houses of his followers, in three distinct strata, and ranging through all the types from circular to rectangular.

A much later stage of development appears at Troy, of which the nine successive strata were excavated by Schliemann in 1870-1890, and by Dorpfeld in 1893-1894. Already in the Second City, destroyed at about 2000 B.C., we find that the rulers built imposing halls of the developed northern type, long, narrow, and rectangular (Fig. 8). Three such buildings stand side by side, independent of each other but parallel, forming three suites of apartments without party walls such as we find in Crete, the intervals between them apparently having been left for the drainage of the roofs. The most important contains an open porch 33 feet square, and behind it a megaron of twice this depth, with a central circular hearth, behind this the walls are prolonged as if there were a rear room. The walls are 4 feet 9 inches in thickness, the lower parts of stone, while the upper parts are of mud brick (the bricks 18 by 27 by 4½ inches), strengthened by wooden beams laid

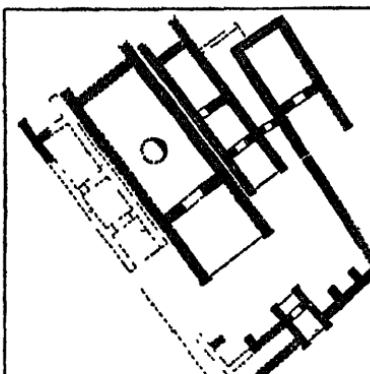


FIG. 8.—PLAN OF THE PALACE IN THE  
SECOND CITY OF TROY

lengthwise every four courses and connected by cross beams at intervals of 18 feet. The ends of the walls, the antae, had special stone socles on which rose a protective facing of vertical planks 10 inches thick. In spite of the great span, 33 feet, there were no interior columns; the transverse beams supporting the roof must therefore have been braced by diagonal struts, in any case we may restore a pitched roof, terminating in a gable over the entrance\*. The adjoining buildings are narrower, but similar in plan; one has an extra room between the porch and the megaron. Before the palace is a propylon, consisting of a gate wall with an open porch before and behind, likewise without columns.

Of the Sixth City, that of which Homer wrote, the traces were missed by Schliemann, because the walls happened to have fallen away at the point where he pierced the hill and the central portion had been cut away in levelling operations by the Romans; it was discovered only in the final excavations by Dorpfeld. The palace, which stood on the higher part, is therefore missing; but from the plans of the private houses on the lower terraces it is clear that the palace must have been of the type which we see finally developed at Tiryns and Mycenae, to which we must therefore turn.

At Tiryns the primitive beehive palace was eventually succeeded, at about 1650 B.C., by a great structure rivalling in dignity those of Crete; simultaneously was erected the earlier palace at Mycenae. In neither case is it possible to make out the plan, since both were completely rebuilt in later times, so that we now see only disconnected foundations and floor levels. Among the remains of these earlier palaces are numerous fragments of magnificent wall paintings, very similar in style to the frescoes at Cnossus.

Also the later palace at Mycenae, dating from the period of the supremacy of the mainland (1450-1100 B.C.), is in poor preservation, because the crest of the hill was levelled off when the primitive Greek temple was built, while other parts of the palace, on a terrace on the south slope, have fallen away into the ravine. It was excavated by the Greeks in 1886-1888, and restudied by the British School in 1920-1923. The steep and winding ascent from the main gate of the citadel led to a small vestibule at the foot of a double stairway 8 feet wide, which ascended to a reception room correspond-

\* Holland suggests rather pointed barrel vaults ("hoop roofs")

ing to the "throne room" at Cnossus, and also gave access to the south-west corner of the main court, here only 38 feet square. At the north-west was, however, a propylon of the Cretan type, with one column between antae. At the north-east corner of this court was the megaron, of the long, narrow type of plan characteristic of the mainlanders, with the portico distyle in-antis, giving access through one doorway to the antechamber, whence another central doorway opened into a megaron 27 feet 9 inches wide and 42 feet 5 inches long, with four central columns enclosing a circular hearth raised on two steps, covered with ten layers of painted stucco. The floors had borders of gypsum slabs imported from Crete, and the central portions were stuccoed and painted; in the antechamber, for instance, there were three panels with dark red borders, filled with zig-zags of red, pink, white and blue. Several other rooms exist, including storerooms and a magazine with great jars, a shrine with two offering tables, and a "tank" with descending steps, but the general plan is obscure because of the destruction of part of the foundations, and because of the confusion arising from its arrangement on several levels, with at least two storeys in places, the latest excavations have revealed still in place the lower part of a pine timber supporting a stairway, which ascended in two flights from a doorway at one side of the portico of the megaron. Some important room must have been at the upper level, where large Mycenaean column bases were employed in the foundations of the Greek temple built on this height. In all this work at Mycenae we may observe a close imitation of the Cretan style, yet containing elements which are characteristic of the mainland, especially the deep narrow megaron with its fixed central hearth; we may suppose that the Achaeans imported artisans and designers from Crete, insisting, however, upon results suited to their more northern climate and to their ancestral customs. But for the study of details we must turn to the later palace at Tiryns.

In the rival stronghold of Tiryns, excavated by Schliemann in 1884, we find the most perfectly preserved of all the mainland palaces (Fig. 9). The ascent through the two successive gateways of the fortification (Plate IX) leads up to a third entrance, the outer propylon, which is worthy of attention as the model of all the great gateways of the Greeks, down to the Propylaea on the Athenian Acropolis; its disposition is that of a portico distyle in-antis, 46 feet wide, the doorway in the cross wall admitting one to a

similar portico facing in the opposite direction. This inner portico opens upon a great court surrounded by columns, thence we pass through a second propylon, similar to the first but only 36 feet wide, and so into the second court of the palace, again surrounded by columns. The bases of the columns still remain *in situ*, and consist of irregular blocks of limestone, with a circular die in the centre of each, raised about  $1\frac{1}{2}$  inches above the ground in order to protect the lower ends of the wooden shafts of columns, as no

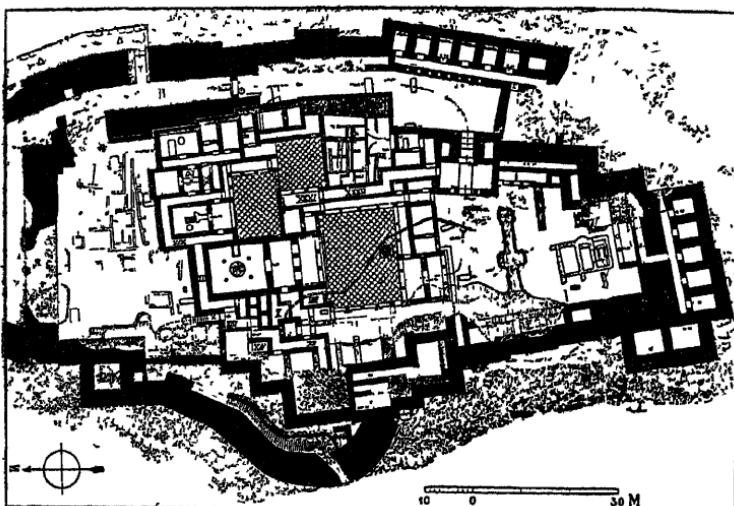


FIG. 9.—PLAN OF THE PALACE AT TIRYNS

capitals were found, they too were probably of wood. In the light of the discoveries at Cnossus there can now be no doubt that these columns tapered downward toward the base,\* like their imitations in stone, the capitals were likewise of the Cretan echinus type, which was imported to the mainland without change.

The second court possesses as its chief features the open altar on one side, originally circular but afterwards rebuilt on a rectangular plan, and opposite this the entrance to the men's apartment, or megaron, of which the plan is almost identical with

\* Dorpfeld assumed that they tapered upward, the credit of insisting upon the reversed taper is due to Perrot and Chipiez. Durm's assumption of a uniform diameter from bottom to top was based upon erroneous measurements.

that at Mycenae. Everything indicates the predominance of this, the largest covered apartment in the building (Plate VIII). Its façade, placed centrally on the court, presents the same arrangement as the porticoes of the propyla, viz., two columns in-antis, the stone bases of the columns and the stone plinths or socles of the antae being still *in situ*. It has long been disputed whether the crowning feature was a horizontal cornice or a pediment; but in view of the longitudinal plan and the racial characteristics of the people, the pediment seems to be more probable (Plate VIII) \*. But the triglyph frieze of alabaster, inlaid with blue glass paste, frequently supposed to have been a part of the entablature, is now known to have formed a bench lining the lower parts of the side walls of the portico, in a position somewhat analogous to the "triglyph friezes" of Crete. Beyond is an antechamber, approached from the portico through three doorways (rather than one as at Mycenae), of which the valves could be folded back into the thickness of the wall, thus virtually throwing the two rooms together into one, as was usually done in Crete. Thence a large central doorway (without pivot holes and so closed only by a curtain) led to the megaron itself, a large room about 32 by 39 feet, the roof carried upon four wooden pillars; within the oblong formed between these was the round hearth, and at one side, facing the hearth, was the dais for the throne. The arrangement of the four columns has suggested to some that there was a clerestory above, but probably their sole purpose was to support the transverse girders of the roof construction. The floor was of stucco, painted in a checker design with the alternate squares filled with the octopus or pairs of dolphins; the plastered walls were painted with conventional ornament and with a frieze representing a hunt. Beside the megaron, but not accessible therefrom, is an inner court, approached only by winding passages from the outer propylon and from the inner propylon, and by a third passage which is carried all round the great megaron, thus ensuring a certain amount of privacy. For off this court opened the private apartment, the thalamos, similar in plan to the megaron but simpler and of smaller dimensions; thus the porch lacked columns, there was no intervening vestibule, and on account of the short span (20 feet) the

\* The internal evidence adduced from the whole plan of the palace, by the supporters of the two opposing views, seems particularly weak. But Reber's restoration seems more justifiable than that of Perrot and Chipiez, for instance, which shows the flat roofs characteristic of the islands.

interior columns were omitted, though the hearth remained in the centre. Beyond, and parallel to this again, lay a third unit consisting of an anteroom and main chamber, even smaller in scale ; the series reminds us of the group of three parallel buildings in the Second City of Troy. On the opposite side of the megaron is the bathroom, with a floor consisting of a single black stone 11 by 13 feet in plan. The rest of the area was occupied by smaller rooms, some in two storeys ; but a noticeable characteristic of this plan is the disposition of all the important rooms on the ground floor, and the absence of the numerous small light-wells of the Cretan palaces implies that the whole was kept low, permitting the introduction of light through windows in the upper parts of the main rooms. The corridors surrounding the megaron and thalamos may have been for the use of slaves, serving to connect the two sides of the palace without making use of the peristyles ; they were in communication also with a small flight of steps leading down to what may have been the service courts of the palace, and to the postern gate.

The palace thus discovered by Schliemann, besides giving the clue to the distribution of the Homeric house as described in the *Odyssey*, betrays the origin of many features which we find reproduced in stone or marble in the perfected types of Greek architecture. Thus the propyla, with their porticoes in-antis, developed into such entrance gateways as those to the Acropolis of Athens, and to the sacred enclosures of Olympia, Epidaurus, and elsewhere. The portico in-antis of the megaron also is the elementary form which is to be found in almost every Greek temple, for although in later times single or double peristyles were built round the cella to give greater importance to the latter and to protect its walls, nevertheless the pronaos or entrance to the cella remained virtually of the Mycenaean plan. Even the grouping of the portico and of the megaron behind, on the same longitudinal axis, is the same which was afterwards revived by the Greeks for their temples. Perhaps the most interesting feature is that of the antae or parastades. In consequence of the ephemeral nature of the materials used in the walls (rubble stone bedded in clay as a base to the crude brick wall), a reinforcement of timber was employed to protect the ends of the flank walls and to assist in supporting the architrave carried by the columns ; this facing, at Tiryns, was raised on stone plinths, being secured to the stone with dowels,

It was the same practice of placing the baulks of timber or posts side by side to encase the ends of walls that gave rise to the antae of the Greek temples, when they had no longer a constructive but only an artistic function. In the partition walls such wooden casing, forming the door jambs, was even more prominent, and likewise left its mark on subsequent architecture in stone, and, although there is no internal evidence to prove that the jambs inclined inward to lessen the bearing of the lintel, yet this inclination is found reproduced in the tomb façades, suggesting, therefore, its wooden origin.

This later palace at Tiryns was destroyed by fire, probably shortly before the Dorian invasion; and on the ruins of its chief megaron rose a smaller megaron, poorly constructed, utilising the foundations of one of the earlier flank walls, and so locating the other flank wall as to leave one of the column bases of the earlier façade exactly on the axis of the new structure. One of the cross walls likewise utilised the older foundations, and the portico was lined with rude benches, the whole forming an anticlimax to the splendid Achaean megaron.\*

A nameless fortress in the Copaic lake in Central Greece, now known as Gla but sometimes identified as the Homeric Arne, contains a palace of unusual plan, with two wings at right angles,† each about 250 feet in length; a great corridor extends along the inner face of each wing, serving as the means of communication between the great megaron, at the extreme end of the north wing, and the more private megaron at the opposite end of the east wing. Each megaron has an antechamber, the latter entered from the corridor at one side, the plan is thus distinctly northern in type, so that we must imagine the roofs of the megaras as sloping to a ridge and overtopping the rest of the palace. No columns were employed. The interval between the two megaras is filled with smaller rooms, in both wings, with a special service corridor just behind the main public corridor.

Traces of other mainland palaces have been found at Orchomenus (opposite Gla), at Thebes, and at Athens, but in such a fragmentary state that they add little to our knowledge.

\* These ruins had always been regarded as those of a Greek temple, until C. W. Blegen demonstrated their immediate connection with the Mycenaean epoch.

† Thus recalling the Cretan summer palace at Hagia Triada.

These megaras of the northerners are also found in regions which were strongholds of the islanders Melos, as we have seen, came under mainland influence in the period of the culmination (the second city); and in the third city, belonging to the period of decline, we see not only houses but also a palace of the megaron type. The megaron has the position for the hearth marked in the centre, but it must have been a portable hearth such as was used in Crete, since there is no trace of ashes; before the megaron was a portico 19½ feet wide and 15 feet deep, with great anta bases on each side but with no central column base. On either side of this megaron are long corridors, that at the right giving access to parallel magazines. This northern plan was even introduced into Crete after the Achaean invasion of 1400 B.C., when all the great palaces were destroyed by fire; later palaces, of the megaron type, have left their traces at Hagia Triada and at Gournia.

No discussion of the Aegean palace would be complete without some allusion to its latest phase, the literary tradition of such a palace as it descended to Homer and was by him transmitted to us. The palace of Odysseus at Ithaca was described by the poet in such detail that it has frequently been the subject of modern restorations, at first on the analogy of the classical Greek house which by no means fits the action of the story. But since the discovery of the Aegean palaces at Mycenae, Tiryns, and Gla, it has been found that they agree better with Homer's description, so that there can now be little doubt that his ancestors, the Ionians who migrated from the mainland to Asia Minor, carried with them the tradition or memory, at least, of the northern or mainland type of palace.

In glancing at the plans of the island and mainland palaces we are struck, not only by the differences in their elements, but also by a difference in their surroundings. In all the Cretan palaces and towns, and also in the first settlement at Phylakopi (Melos), we note an entire absence of those walls of defence which in the northern settlements were deemed to be of the greatest importance. It is not as if the Cretan architects were unacquainted with the art of fortification; in the "town mosaic" from Cnossus appear towers and gates of regular ashlar masonry, and similar representations occur on a silver rhyton of Cretan workmanship from Mycenae; but it is evident that the bulwarks of the Minoans were rather in the wooden walls of their navy.

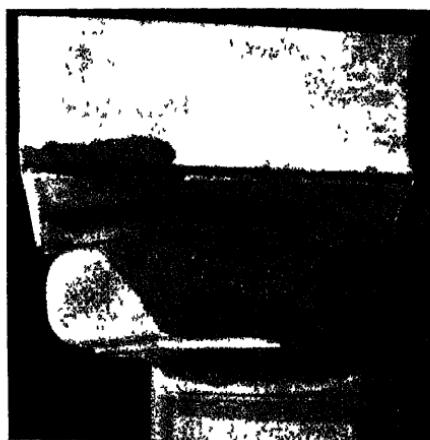
PLATE IX.



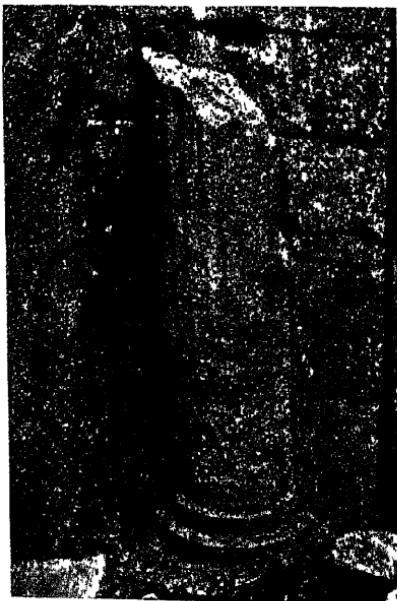
APPROACH TO THE INNER GATE, TIRYNS.



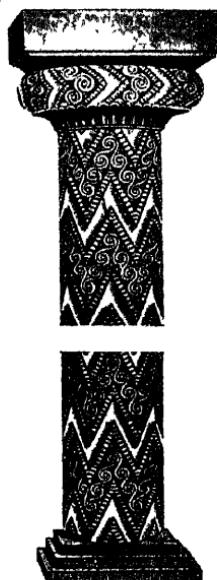
THE LION GATE AT MYCENAE.



DETAIL OF CAPITAL FROM THE TOMB  
OF AGAMEMNON AT MYCENAE.



COLUMN BEFORE TOMB OF  
CLYTEMNESTRA, MYCENAE.



COLUMN FROM TOMB OF  
AGAMEMNON, MYCENAE.

The northern method was very different. The palace itself formed a citadel, placed on a low hill, and surrounded by strong walls ; generally the houses of the nobles and retainers were likewise included within the walls , but the agricultural classes were scattered in unwalled villages, and only assembled within the walls in time of war. Thus the citadel of Troy was too small to form an actual city, containing a large population ; Tiryns was in a large part bare of houses, the empty area within the walls forming merely an emergency shelter ; the lower city at Mycenae was unwalled in Mycenaean times , \* Sparta likewise was an unwalled town ; round Corinth have been identified eleven Mycenaean villages within a radius of seven miles of the temple of Apollo, which may yet prove to be the site of the central palace

One of the strongest sites in the archaic period was the Second City of Troy,† of which the walls form an eleven-sided polygon, with towers and angle bastions, and with a great gate tower 59 feet square, traversed by a road 11½ feet wide, the whole circuit being only 1300 feet. Another gate is double, a sort of propylon, with two gate walls enclosing a vestibule, with porches outside and inside. The ramps traversing the gates were carefully paved. The walls have a substructure of small hewn stones, at one point 28 feet high, the face battering at about 45 degrees, and crowned by a wall of sundried brick, 13 feet in thickness and still remaining to a height of 10 feet, strengthened by wooden beams 12 inches square. These walls show three successive states, the southern line having been twice demolished for the sake of enlargement.

In the Sixth Citadel, a thousand years later, the walls formed a circuit of nearly half a mile, enclosing an area three and one-half times that of the Second Citadel ; the general plan is again a polygon, but with facets only 30 feet long, meeting at angles which break forward 4 to 12 inches. In these walls much more stone was used, the battering substructure being 13 to 17 feet in thickness, and 20 feet high, crowned by a vertical wall of stone, 6 feet in thickness ; though even here there seems to have been a superstructure of mud brick. There were probably four great towers, of which the most important, at the north-east, 59 feet wide and projecting 26 feet from the wall, enclosed a spring. There were also four gates, more scientifically planned than in the Second

\* The existing city walls are Hellenistic

† Even the First Citadel was strongly fortified, with a wall 8 feet thick

Citadel, necessitating a flanking movement along the wall as at Tiryns and other mainland sites

In some of the smaller Aegean islands we find fortification walls of uncertain date, probably erected under mainland influence. The most important of these are the fortifications at Phylakopi (Melos), belonging to the Second and Third Cities. These walls are 20 feet thick, composed of two faces each  $6\frac{1}{2}$  feet thick, with the interval divided by means of frequent cross walls into cells, which were filled with rubble.

In connection with the earlier palace at Tiryns only the upper part of the citadel was fortified, and the same was probably true at Mycenae; the sites thus enclosed were barely large enough for the palaces themselves. At Tiryns, for instance, this earlier fortification was only 340 feet long and 220 feet wide, while its outer gateway (with no actual gate) was situated under the third gateway of its successor, and there must have been an inner gate behind it.

One of the first acts of the Achaean invaders, at about 1400 B.C., was the enlargement of the fortifications of Mycenae, with Cyclopean masonry of less imposing character than that which we shall note at Tiryns; for the site, with its overhanging cliffs, possessed greater natural advantages, and did not need such heavy walls. The area enclosed was now roughly triangular in shape, about 1,050 feet in length and at most 570 feet in width, with a perimeter of more than 3,000 feet. There is one postern gate, but our chief interest lies in the main gate, the so-called "Lion Gate," which is in a fine state of preservation even though it has been known since antiquity and was never buried (Plate IX). The ascending ramp approaching it is 48 feet long and 30 feet wide, with, as usual, a heavy wall on the right side. The illustration shows the stone jambs of the doorway, and the still greater lintel, which is 8 feet broad,  $3\frac{1}{2}$  feet high at the middle, and has a length of  $16\frac{1}{2}$  feet, with a clear span of 9 feet. Such a lintel would assuredly bear any superincumbent weight that the builders of these fortifications were likely to put upon it; but either from caution or custom a triangular void was left, so as to relieve the lintel. It was to fill this void that a limestone slab, 12 feet wide and at present 10 feet high (Plate XI), was carved in relief with a heraldic religious composition, symbolic of pillar worship, the sacred pillar representing the great mother goddess, the protecting divinity of the citadel. The central pillar is, perhaps, the most interesting

PLATE XI



DETAIL OF SCULPTURE OVER THE LION GATE AT MYCENAE



part of the composition to an architect, it stands on a kind of twin pedestal or altar, with the shaft tapering downward,\* and a capital with echinus and abacus foreshadowing to a certain extent the Greek Doric, and this in turn is surmounted apparently by a fragment of entablature, which, like the ornament over the tomb doorways, suggests the wood log ceilings of the primitive house. The sculpture, the oldest on a large scale yet revealed on the Greek mainland, shows a technical skill in outline and modelling and even a nobility of expression (as in the resolute fore-legs and paws) that give it a high place; the heads have disappeared, and the holes for fastening indicate that they were carved separately (probably in steatite) in order to obtain a greater relief. The parastades running back from the jambs of the gate were originally roofed over with wood to form a porch within the entrance with a guard room at the left. It does not seem possible to date this work earlier than 1300 B.C., for it is clearly not as old as the greater part of the fortification walls, the walls in immediate connection with the gate had originally been of the Cyclopean type, and probably had no actual gate between them, only afterwards, at the time of the insertion of the gate, were they faced with regular ashlar.†

The later fortifications at Tiryns were built a little after those at Mycenae, but still during the fourteenth century B.C. It was then that the hill received its present shape, forming a stronghold which bears a close resemblance to a fortified castle of the Middle Ages, in outline like the shape of a shoe, about 950 feet in length and 330 feet in width, and levelled to form three terraces. The lowest terrace, left absolutely bare with the exception of a great storehouse or granary, and designed to form a refuge for the people of the surrounding villages in time of war, forms the heel, while the upper citadel (Fig. 9), the ball or forepart of the foot, is the part best preserved, exhibiting the plan of the peristyles, propyla, megara, and all the lesser apartments of the dwelling of a great

\*Durm's theory that this shaft is cylindrical is erroneous, the diameter is  $12\frac{1}{2}$  inches at the top and  $10\frac{3}{4}$  inches at the bottom.

† That the ashlar facing about the Lion Gate and the main postern gate are later insertions is shown by the similar ashlar masonry of the south-east bastion of the citadel, which is clearly an addition. The so-called intermediate or third class into which the masonry of the Aegean period has been divided, that of polygonal type, seems really to be Hellenistic Greek; for it is represented by three repairs in the walls of Mycenae which are apparently subsequent to the destruction of the town in 468 B.C.

Achaean chief. The middle terrace, with a heavy wall to defend it against the lower terrace if necessary, was occupied by the houses of the retainers. Surrounding the whole citadel, and in places lying just outside that of the earlier palace and lower on the slope, is a high wall of enormous thickness, 24 to 57 feet, constructed of great unhewn stones with the joints filled with small stones and yellow clay (believed by later generations to be the work of a race of giants known as the Cyclopes, whose name is therefore given to this kind of masonry) ; the stones are much larger than those at Mycenae. At two points, in the new portions of the outer wall, are contrived galleries each with five or six lateral chambers, at one time thought to have been for purposes of defence, but now recognised as store-rooms ; like the domed tombs to be described later, these passages and chambers (the latter 10 feet 9 inches wide) are roofed by courses of stone in horizontal beds, projecting one over the other, and cut on the under side to the contour of a pointed arch (Plate XII). There are three postern gates, two to the lower plateau, and the other to the palace proper ; the latter is of peculiar interest because of its winding stairway (sixty-five steps are preserved) with high walls for the defenders on both sides and the trap door over a deep *oubhette* at the top. The principal entrance in the east wall is approached by an inclined way, 19½ feet wide, so arranged that assailants attempting this path would be subjected to an inconvenient attack upon their right flank, the side not protected by their shields, before they could reach the gateless opening in the great wall. Even did they carry this point they would merely find themselves in a *cul-de-sac* between the outer and inner walls, with the strongly-barred second gate (Plate IX) at the end ; or they might turn to the right and penetrate the lower terrace, but in either case they would still be opposed by the great inner walls of the middle and upper terraces.

These two examples were but links in the great chain of Mycenaean citadels which dominated the Argive plain—Mycenae, Argos, the Argive Heraeum, Mideia, Asine and Tiryns. Apart from these we find the most imposing remains at Gla, where the walls are about two miles in circumference. The Acropolis of Athens, within whose circuit was contained so much of what was greatest in Greek art, originally formed another of these Mycenaean citadels. Discoveries in the district round Athens

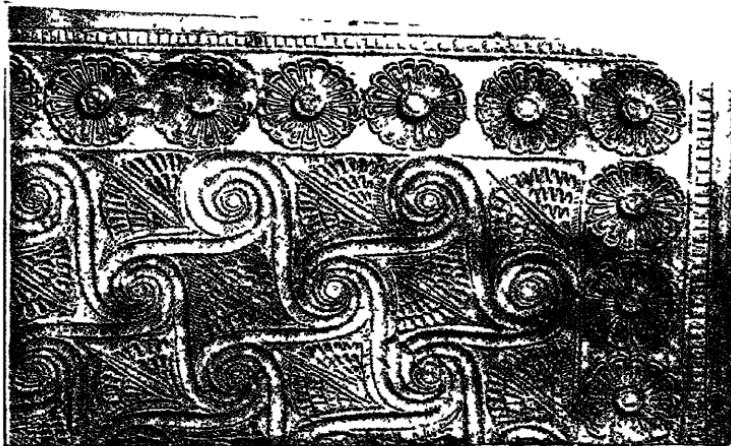
PLATE XII.



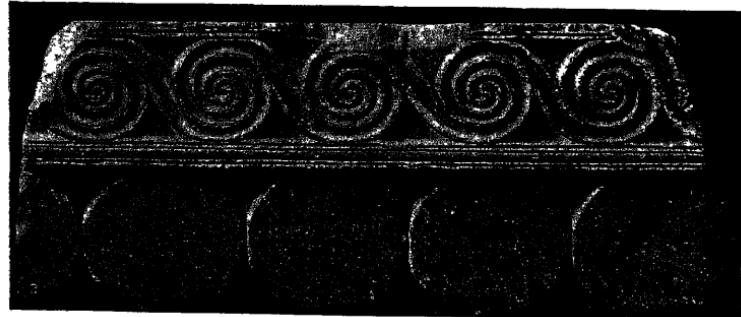
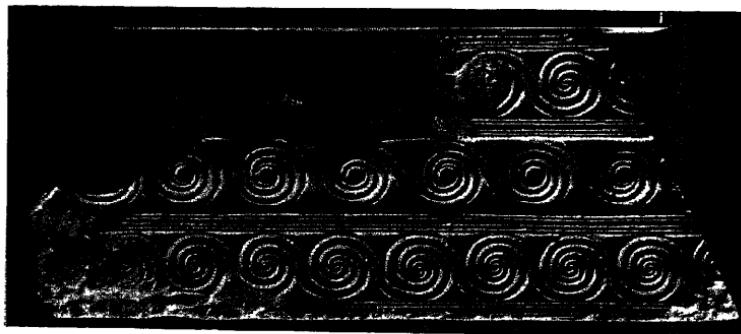
INTERIOR OF THE TOMB OF CLYTEMNESTRA  
AT MYCENAE.



GALLERY IN THE WALLS AT TIRYNS.



DETAIL FROM CEILING OF LATERAL CHAMBER,  
TOMB AT ORCHOMENUS.



FRAGMENTS OF FAÇADE ABOVE THE DOORWAY OF THE  
TOMB OF AGAMEMNON AT MYCENAE.

have revealed rock-cut tombs and tholos tombs, together with vases and jewellery similar in style to those of the Argolid, pointing to its occupancy as a civilised centre at a date between 1500 and 1100 B.C., and on the Acropolis itself, on the site of the Old Temple of Athena destroyed by the Persians, have been found the remains of a Mycenaean palace, column bases and foundation walls, while the entire circuit of the Acropolis is enclosed by a Cyclopean wall of the same date. But the Acropolis was a site continuously occupied and frequently remodelled, and like every city that has retained her population instead of being suddenly deserted, has to some extent submerged her earlier history so far as that was written in stone. Thus it has come to pass that we can read the story of the Mycenaean period, all important in the evolution of Greek art, chiefly in the buried cities of the Peloponnesus, while in Athens its vestiges are few indeed.

Such are the most important of the secular works of the Aegean peoples. In addition, we might consider a few works of public utility, bridges such as those near Mycenae and Epidaurus, fountains such as that below Pirene at Corinth, were it not that such structures had little influence on future architectural developments.

\* \* \* \* \*

A noteworthy characteristic of the Aegean civilisation is the absence of religious architecture. Traces of the Aegean religions exist, to be sure; we have evidence of the worship of a supreme mother-goddess (Rhea, the mother of Zeus), and perhaps of other divinities, as well as of pillar worship; and we also possess considerable illustrative material with regard to the forms of ritual. But this worship seems to have been conducted in rustic shrines or in small chapels in the palaces, of little architectural importance; the most imposing structures are those represented on gold plaques from Mycenae and Volo, in a fresco from Tiryns and in the so-called "Temple fresco" of Cnossus, the last (Plate VII) represents three shrines, the middle one distyle in-antis and raised above the others, which have but one column in-antis (a peculiarity which is proved to be no mere painter's convention by the single bases found in the propylaea at Cnossus and Phaestus). Among larger structures may be cited the hill-top shrines of Petsofa and Mount Juktas in Crete, originally mere open sanctuaries in which the rocky peak itself was worshipped, later provided with rectangular buildings resembling the simplest house plans, with an outer

and an inner room, and a magazine. Even less important for our purposes are the cave sanctuaries, such as the Dictaean cave at Psychro, the Kamares cave on Mount Ida, and the Skoteino cave above Cnossus \*

Rock-cut tombs, memorial cairns, barrows, and other forms of graves are among the most frequent traces of a prehistoric race, and often the earliest attempts in architectural expression or sculptural art that have survived. And so it is from its tombs, as well as from the palaces, that the story of the age of Aegean culture is being gradually reconstructed.

There are six distinct classes of tombs in the Aegean region. (A) *Pit graves* were those in which, as to-day, the great majority were no doubt interred. Those of rectangular plan, like the rectangular house, seem to have been at first characteristic of the islanders. The simplest form was the *cist grave*, consisting merely of six slabs of stone or marble, one forming the floor, four the walls, and one the cover resting on the walls; the whole was then covered with earth so as to leave no outward indication. These are found especially in the Cyclades (where they form the earliest architectural remains) and in Crete. Sometimes the sides were lined with rubble walls rather than with single slabs, and the roof was sometimes of reeds and clay, or of timber, or of overlapping slabs corbelled toward the centre. A development from these was the *shaft grave*, sunk much deeper below the surface (7 to 14 feet), the lower part either lined with rubble walls or provided with a rock-cut ledge on which the cover slab might rest. For ease in reopening these graves, for subsequent interments, it was sometimes preferred to place the body, not in the bottom of the shaft itself, but in a chamber excavated at one side of the bottom of the shaft, and afterwards closed with a vertical wall. But such forms were by no means confined to the islands; due to island influence, early cist graves occur at Tiryns, shaft graves with lateral chambers at Corinth, simple shaft graves at Pylos (Messenia) and, most important of all, on the Acropolis of Mycenae.

Here the shaft graves, in the period 1650-1450 B.C., covered a large area on the east slope of the hill, outside the older walls; six of them, containing seventeen bodies (eleven men and six

\* The primitive cave-temple at Delos, sometimes regarded as Aegean, is more probably primitive Greek.

women) were apparently royal ; the bodies were covered with gold ornaments and jewelry, and surrounded by all manner of arms and vessels. These graves were cut in the solid rock, in the form of rectangular shafts sunk from the natural surface of the hill, with the result that they are on very different levels ; the floors were covered with pebbled pavements, the sides lined with battering walls which supported wooden beams with the ends encased in bronze, and on these in turn were laid stone slabs, the upper

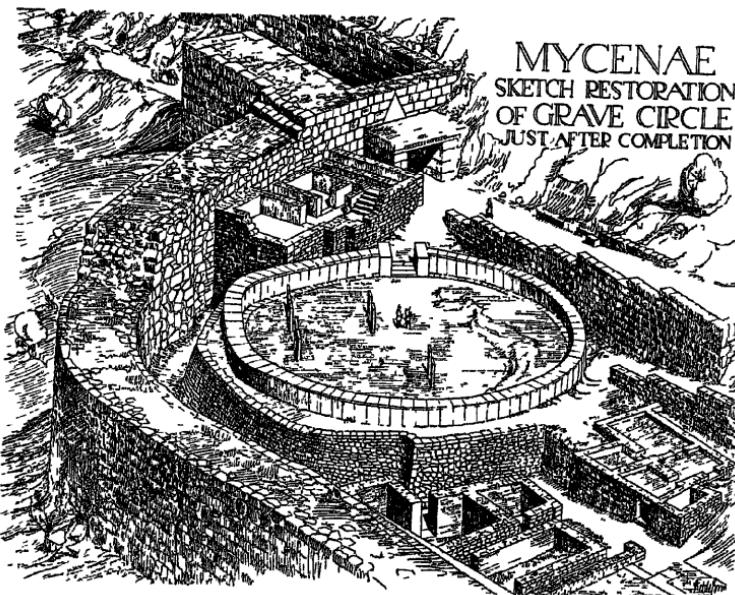


FIG 10.—THE GRAVE CIRCLE AT MYCENAE (Restored by De Jong )

portion of the shaft being filled in with earth. The largest of these graves is about  $18\frac{1}{2}$  by 24 feet in plan. They were marked by stelae or upright slabs, eleven of them (those for the men in the royal group) rudely sculptured in a fashion bearing a curious resemblance to the Celtic cross placed on the graves of our early British ancestors, and in the centre of the group was built a circular altar for the offerings to the deified kings.

Long afterwards, when the new fortifications at Mycenae were laid out at about 1400 B.C., their line was carried right through the old cemetery, and then all the graves were emptied except

six of the most important, those of the kings. The latter were protected by a semi-circular retaining wall (Fig 10), battering at about 75 degrees; and the fortification wall was made to deviate from the line it would normally have followed, making a curve concentric with the terrace wall, with the result that the graves, contrary to custom, were now included within the Acropolis. They now formed a sacred precinct, the slope being terraced up with earth to form a uniform level, in places 13 feet above the original level, the old stelae were elevated to this new level. Most important is the surrounding wall, a slab circle 95 feet in diameter, the slabs being arranged in two concentric circles 4 feet apart, filled in between with earth, connected by wooden braces, and covered with cross slabs, thus forming a heavy parapet from 3 to 5 feet in height, at one side, toward the Lion Gate, was left an entrance 8 feet in width\*. Such was the sepulchral precinct which survived through classical times, and was described by Pausanias in the second century of our era, the Greeks attributed the graves to Agamemnon and his associates, and these traditions were accepted by Schliemann; but now we know that they antedated the family of Agamemnon by three to four centuries †.

(B) *Rock (or chamber) tombs*, of which vast numbers have recently been excavated, are of greater architectural importance. These tombs are carved out of the solid rock of the hillside, having a short and narrow passage (*dromos*), generally horizontal but sometimes sloping downward, terminated by an entrance doorway, which admits to a tomb chamber, usually rectangular but sometimes of irregular plan. Very often a smaller rectangular chamber adjoins, entered from the greater one; the latter was sometimes provided with a bench and served as a vestibule, the inner chamber being filled with bodies. The roofs of the chambers might be hewn in the form of a vault or of a gable roof. Instead of actual doors, the entrances were filled with rubble walls, which had to be taken down and rebuilt for each interment. The enframement of the doorway, however, might be stuccoed and painted, with stripes, wave patterns, or a series of rosettes. One of the largest of these tombs was recently excavated at Mycenae, about 20 feet

\* The existence of this entrance is one of many indications that the whole was not, as some have assumed, covered with a tumulus of earth.

† The only analogous monuments yet discovered are the circles of stones built round cist graves at Leucas, earlier in date and more primitive in form than the grave circle at Mycenae.

square and 20 feet in height, with a *dromos* more than 90 feet in length.

(C) *Tholos tombs*, or beehive domed chambers, in general form very much resemble the rock tombs, though their construction was usually very different. For while they, too, were cut in the side of a hill, and approached by an open horizontal avenue or *dromos*, yet instead of being rock-cut they were lined artificially with masonry; and the tomb chamber, instead of being excavated from the entrance passage, was formed by sinking from above a well of the desired diameter, within which the pointed dome was then built up in horizontal courses, which were backed with earth as they rose. The well was not sunk so deeply but that the top of the dome projected slightly above the surface of the ground, and was therefore covered with a slight artificial tumulus, sometimes even with a low surrounding wall. It is notable that this form reproduces, with the conservatism characteristic of funerary architecture, the most primitive form of the circular hut. Many of them, of large dimensions, carefully dressed masonry (*breccia*), peculiar construction, and with highly decorative façades, are to be classed among the most important remains of the Mycenaean era. Opinion as to their purpose once wavered between that of treasures or tombs, but modern research is now satisfied that their purpose was for interment of the royal dead.

The earliest suggestions of this form of tomb are to be found in Crete, where, between 2700 and 2000 B.C., a few great community vaults were constructed of small irregular stones carried up in clay and rubble, probably forming a dome, the largest 28 feet in diameter and containing about two hundred bodies\*. This type was abandoned only to be revived again on the Greek mainland by the Achaean invaders, after 1450 B.C. There we find a lengthy series which shows a gradual structural advance. First we have those in which the construction is rather primitive, the walls of small pieces of undressed limestone bedded in clay, the entrances showing no knowledge of the principle of the triangular relieving opening above the lintel, which is of harder limestone; the walls of the dromos are sometimes merely excavated in the rock, without linings. Three of the nine tholos tombs at Mycenae, among them

\* At Hagia Triada, others exist at Hagios Onouphrios, Koumasa, and Siva near Phaestus. There is no actual proof that they were domical, apart from the heaps of stones which had fallen into the interior.

the tomb of Aegisthus (about 40 feet in diameter), belong to this stage, as well as the three at Triphylian Pylos, and one at Thoricus in Attica. The second stage is characterised by the adoption of more regular architectural lines ; but since the harder material could not yet be readily cut to such forms, the façade formed a mere screen of light poros limestone laid up as ashlar masonry, with the heavier construction behind it. Such a screen was added in later times to the tomb of Aegisthus, independently of the older façade behind, and three other tombs at Mycenae, together with one at the Argive Heraeum, were actually designed with double façades, but now bonded together. For the lining of the doorway, behind the poros façade, larger and harder stones were selected, conglomerate or breccia, dressed as yet without the aid of the saw, and likewise the lintels, which on account of their great span could not have been of poros even on the façade, were of this hard breccia. In these more developed examples which follow the tomb of Aegisthus we find a new feature, the triangular relieving opening above the lintels, filled with a screen of light poros ashlar. The interiors were still of rubble except immediately around the doorway ; and the dromos, lined partly with rubble and partly with poros ashlar in the earlier examples of this group, were lined wholly with poros ashlar in the later examples. In the latest of these, the Lion Tomb at Mycenae, the rubble wall hitherto used for closing the doorway was replaced by actual doors, with a stone threshold, placed however practically flush with the façade as was the case with the earlier rubble walls. In the third group we see the height of technical skill, all the work, not only on the façade but also the lining of the dromos and tholos, being of hard breccia blocks, frequently of tremendous size, but now conquered by means of the saw. As in the Lion Tomb, the entrances were closed by double doors resting on stone thresholds, but now set back at the middle of the passage in order to protect them from the weather. To this latest stage, which in workmanship is comparable to the Lion Gate and the latest portions of the palaces at Mycenae and Tiryns, we may assign the three other tholos tombs at Mycenae (including those popularly assigned to Agamemnon and Clytemnestra) and the great tomb at Orchomenus. Of these, the largest and most perfect of the tombs at Mycenae, that which is variously called the "Tomb of Agamemnon" or the "Treasury of Atreus," may

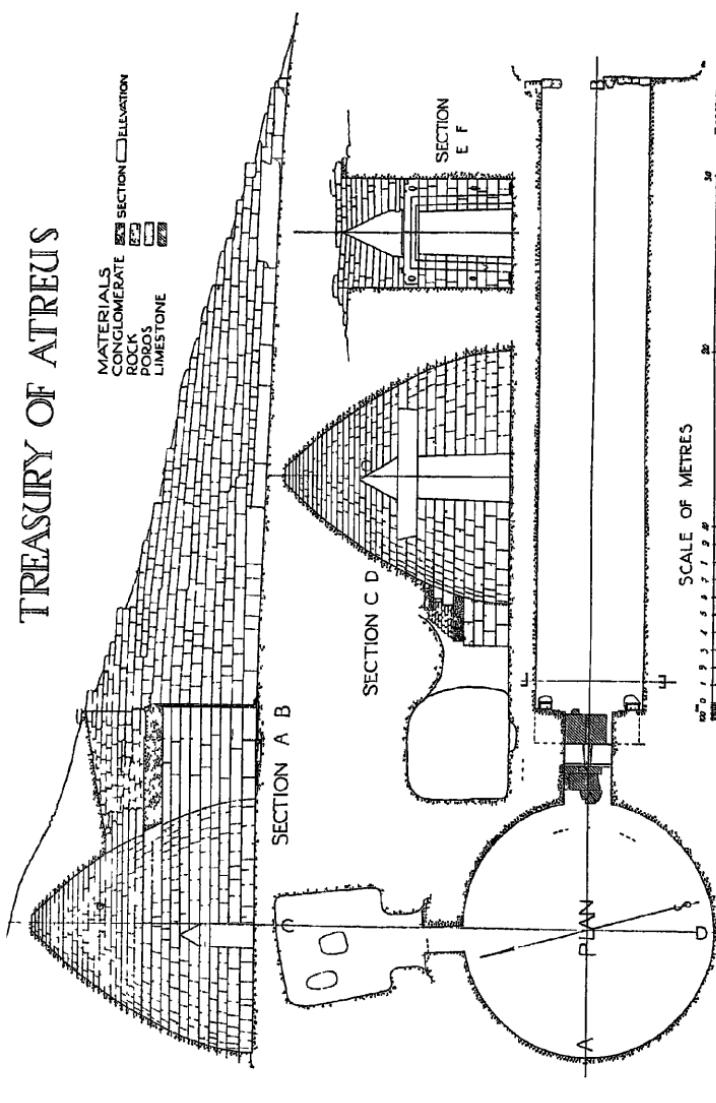


FIG. 11.—PLAN AND SECTIONS OF THE TOMB OF AGAMEMNON AT MYCENAE

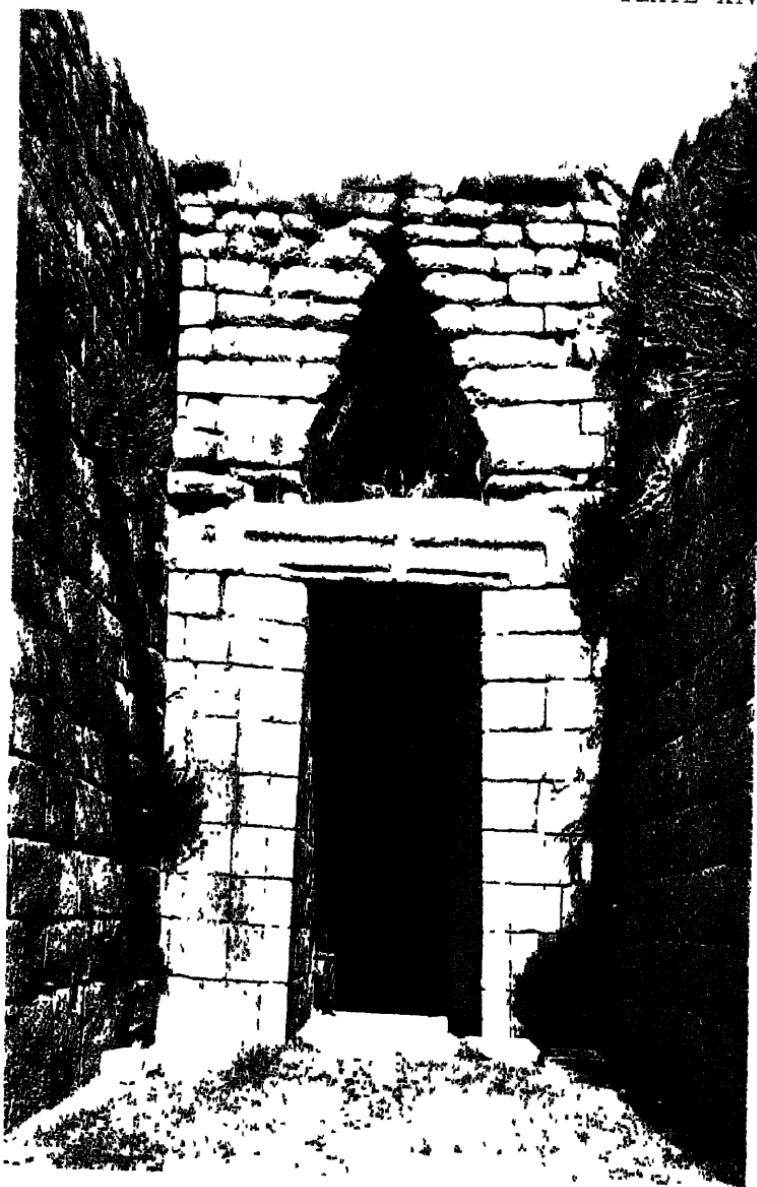
be taken as representative of the type, and described in detail (Fig. 11).

The domed part is about 48 feet 6 inches in diameter, and 45 feet 4 inches in extreme height. Directly upon the floor, which is formed of rammed clay, is laid, without other foundation, the lowest course of the masonry. The curve of the pointed dome begins at the floor and is carried up through thirty-four courses. The dome is not constructed on the arcuated or vault principle; the courses simply project one over another, uncemented, until by the lessening diameter of the concentric circles the top could be covered by a single stone, hollowed on the under side to continue the curve to a rounded point. The blocks of stone were in plan square or rectangular, so that there were wide gaps at the back which were filled in with small stones and clay, even in the upper courses where the stones approached more nearly the shape of voussoirs. The inner face of the masonry appears to have been dressed down after the construction was complete. The masonry as it exists to-day shows a great number of holes over its entire surface, those in the upper part being single and containing pins which apparently fastened rosettes of bronze, while in the third, fourth, and fifth courses the holes are larger and grouped in pairs, evidently for securing friezes of metallic plates, producing on the whole a stately and impressive interior \*. A very similar appearance was presented by the "Treasury of Minyas" at Orchomenus, which has been famous since antiquity, Pausanias claiming that it was not less wonderful than the pyramids; the upper part of the dome has now fallen in, but the lower part is of practically the same dimensions (46 feet in diameter), with the same construction in smoothed masonry, and with the same holes for the attachment of rosettes above the fifth course that we found in the "Tomb of Agamemnon". In the "Tomb of Clytemnestra" the masonry of the interior is not so regular and is composed of smaller courses, in startling contrast with which is the high course containing the lintel, carried round like a belt course (Plate XII).

In two of these examples there is a smaller rectangular chamber at one side of the tholos and entered from it, the doorway which appears in the section of the "Tomb of Agamemnon" is that

\* From such evidence of metal attachments it is now possible to understand how Homer came to speak of brazen walls and bases, silver columns and lintels.

PLATE XIV



ENTRANCE TO THE TOMB OF AGAMEMNON AT MYCENAE



which leads to the small secondary chamber. In this case the chamber is about 27 feet square and 19 feet high, with a base for a central pier to support the ceiling, the walls were perhaps lined with alabaster slabs. Far more imposing, however, was the comparatively small side chamber at Orchomenus, only 9 feet by 12 feet 4 inches in plan; the ceiling was formed by four great slabs of green schist 16 inches thick, the lower surface carved with a pattern of rosettes and spirals which was clearly derived from Egypt (Plate XIII); the walls were lined with thin slabs covered with a similar pattern. This chamber at Orchomenus was reconstructed in 1914. Many of the tholos tombs, however, lack the side chamber, as in the great "Tomb of Clytemnestra" at Mycenae; sometimes as a substitute there were pit graves sunk in the floor of the tholos, as at Vaphio and the Argive Heraeum;\* or there might even be a sort of sarcophagus built up in rude masonry at one side of the tholos, as at Thoricus.

The dromos, or entrance passage, by which the remains of the dead would be conducted to their final resting place, is about 21 feet wide and 115 feet long in the "Tomb of Agamemnon" (Fig. 11), 20 feet wide and 125 feet long in the "Tomb of Clytemnestra," but only 16 feet 9 inches wide in the "Treasury of Minyas." The walls are lined with masonry, rising gradually from the entrance to the façade, where the height is 45 feet in the "Tomb of Agamemnon." The top was often finished with a special coping.

This led to a splendid portal, which, in the case of the "Tomb of Agamemnon," is in even greater degree than the dome itself the glory of the edifice. The present state of this doorway is shown in Plate XIV; the façade is 20 feet 8 inches wide and 46 feet high, with a doorway 18 feet 2 inches in height, varying in width from 9 feet 1 inch (exactly half of the height) at the bottom to 8 feet 1 inch at the top, with a reveal of 17 feet 6 inches (at the bottom). The lintel is composed of two colossal stones, one of them 29 feet 6 inches in length, 16 feet 6 inches in width, and 3 feet 4 inches in height, weighing more than 100 tons, above the lintel is the characteristic relieving opening. Similar treatments and dimensions appear in the "Tomb of Clytemnestra" and the "Treasury of Minyas."† The

\* Two shallow pit graves occur even in the "Tomb of Agamemnon" at Mycenae.

† The stones, however, are smaller, the inner lintel at Orchomenus weighing only 26 tons.

thresholds in each case are composed of two blocks with a wedge between to thrust them tightly against the side walls. Pivot holes in the thresholds and lintels show that there were double doors. The thresholds and the immediate jambs of the doors were sheathed with bronze, fastened by bronze nails. In the richest tombs the façades were revetted with slabs of coloured stones, red, green, and white, instead of the painted stucco of the rock tombs, and the doorways were surrounded with architectural enframements of columns and architrave. In the "Tomb of Clytemnestra" there were engaged columns with vertical fluting (thirteen flutes in the semi-circumference), part of one shaft remains in place (Plate X), with a downward taper of  $\frac{1}{4}$  inch in this piece alone, while dressed surfaces show that in a height of  $10\frac{1}{2}$  feet the taper was more than  $2\frac{1}{2}$  inches. The architrave was faced with two projecting courses of gray stone, the lower carved with disks in low relief, the upper with spirals, and above this were carved slabs of red porphyry, of which some fragments exist. More detailed information is to be obtained from the "Tomb of Agamemnon," of which the decorative features are distributed in various museums, at Nauplia near Mycenae itself, Athens, Berlin, Munich, Carlsruhe, and the British Museum. The immediate enframement of the doorway consists of receding fascias cut on the ashlar masonry of the jambs and on the lintel. Outside this, now only the bases of the engaged columns remain in place, of breccia with a stepped profile. The most important portions of the green alabaster shafts have been presented by the Marquis of Sligo to the British Museum and are there set up, another long piece is in the museum at Athens, their total height was 20 feet  $6\frac{1}{2}$  inches, with the capitals, about 12 diameters. Their lower diameter is  $20\frac{1}{2}$  inches, and the upper 22 inches, making the diminution about one-fifteenth, with the same reversed taper that we saw in the shaft on the Lion Gate and in that at the "Tomb of Clytemnestra";\* but instead of the smooth shaft of the former, or the simple vertical fluting of the latter, the surface of each shaft is covered with nine chevron bands of alternate spiral ornament and plain (slightly concave) surfaces (Plate X), perhaps imitated from a metal sheathing applied to wooden columns. The capital consists of a necking in the form of a cavetto, vertically fluted, an echinus with the same chevrons that appear on the shaft,

\* Durm's assertions to the contrary were again based on erroneous measurements.

and another cavetto forming the transition to the plain abacus , an incision below the necking was probably intended for an astragal of bronze, giving the profile found on the Lion Gate. Above the capitals were plinths or dies bonded into the wall and projecting from it , these were probably connected by the band of greenish stone like the columns, of which a fragment is in the British Museum (Plate XIII), resting directly on the architrave of the doorway, the lower fascia carved with disks to represent beam ends and the upper fascia carved with spirals, like the courses still *in situ* on the "Tomb of Clytemnestra." On the dies rested pilasters which carried up the lines of the columns and enframed the upper portion of the façade, where the details of the arrangement are largely conjectural. Between the pilasters the wall evidently receded to the plane of the façade , among the elements of its revetment are two sizes of red porphyry friezes carved with the so-called triglyph motive, 7 inches and  $9\frac{1}{2}$  to  $11\frac{1}{2}$  inches in height, also bands of rosettes, and white marble slabs showing a band of spirals along one edge. But the only fragments of which the exact positions can be identified are those which filled the triangular relieving opening, evidently set back slightly behind the wall plane a small piece of red porphyry at Athens, carved with two horizontal bands of spirals, would just fit the apex of this opening, and a red porphyry slab in the British Museum (Plate XIII), carved with a triple band of spirals, is cut to fit against the right edge of the opening. It would seem therefore that the entire triangular panel was filled with rows of spirals rather than by any such heraldic design as that over the Lion Gate \*

The last phase in the development of the tholos tombs is represented by the rude example at Menidi in Attica, though its rudeness may be due merely to its provincial character. The construction

\* The restoration by Chipiez, reproduced in the first edition of this work, is now, like Reber's, impossible. It shows the columns with a diminution of one-sixth and with thirteen chevrons. There is no foundation whatever for his elaborately carved lintel, and he fails to take note of the plain projecting course crowning the wall (part of which still exists, and can be seen in Plate XIV), which was specially provided to protect the ornamental facing below. On the other hand, Chipiez is certainly correct in filling the triangular panel with rows of spirals. Because of the erroneous treatment of this panel, restoring a heraldic design following the tradition set by Ittar (Lord Elgin's architect), Donaldson, Blouet, Adler, and Reber, we must likewise reject the restoration by Spiers, reproduced in the second edition of this work , the latter restoration, furthermore, was made before the discovery of the pilasters above the columns, and so is of value only because of its correct representation of the portion below the column capitals.

is of rubble throughout; its chief interest lies in the fact that there are four horizontal lintels above the main lintel, instead of the usual triangular relieving opening, though the latter form is discernible on the interior of the domed chamber.

These tholos tombs were brought by the Achaean invaders even into Crete, there reviving a type which had died out six hundred years previously. At least one of these Cretan tombs, however, betrays an attempt to reconcile the beehive section with the rectangular plan; at Isopata, just north of Cnossus, is a royal tomb approached by a dromos of the usual form, leading however to a vestibule about 22 feet long, through which in turn is entered the rectangular tomb chamber, 20 by 26 feet in plan. The walls are of ashlar masonry; the end walls are vertical, while the side walls curve inward until the interval between them could be covered with a single row of slabs, giving the appearance of a pointed barrel vault. Others of this rectangular type occur at Damana, Maleme, and Mouliana; only at the very end of the Aegean age did the true tholos type reappear in Crete. Just after the close of the Aegean age this form of tomb became even more widely spread: Achaean refugees carried it to Asia Minor, where small examples have been found at Colophon and at Assarlik in Caria.

(D) *House tombs*, more specifically imitating house types, formed rather the Cretan counterpart of the tholos tombs. These were built chambers of squared stones, miniature houses of rectangular plan, with roofs of reeds and clay, and doorways blocked by slabs. Such were the community tombs of Mochlos, Gournia and Palaikastro; at Palaikastro we find square buildings divided by partitions into long narrow compartments; among the examples at Mochlos are some with outer and inner rooms, in one case the inner room being placed beside rather than behind the outer one, because of the rocky slope behind, and so giving a plan like a maeander pattern.

(E) Terra-cotta coffins and (F) burials in jars are not of sufficient architectural interest to merit description. (G) The tumuli of the Ukrainian invaders of Asia Minor do not really come within the Aegean cycle.

In all these tombs it was deemed advisable to surround the occupant with the necessities and luxuries of life; but scepticism as to their practical utility, coupled with regard for the resources

of the living generation, led to the manufacture of a class of light gold-leaf ornaments, utensils, and masks, which are the most prolific product of these graves, now violated by the hand of man. In the case of the tholos tombs, however, it is only in the outlying districts that they are found with their contents intact, as at Menidi and Thoricus in Attica, at Vaphio near Sparta, and at Triphylian Pylos near Olympia. Elsewhere they are usually empty, with rubble walls filling the doorways, as in that at the Argive Heraeum, or masking the façade or forming a retaining wall at the beginning of the dromos, as in most of those at Mycenae; this careful concealment suggests that they were emptied by the Mycenaean people themselves. Some may, however, have been plundered only in later times; they were, at least, open in the historic period, the "Treasury of Minyas" containing pedestals and other traces of Hellenistic and Roman times, while a tholos tomb at Tiryns contains a Roman oil mill.

\* \* \* \* \*

How this early civilisation, so far on the right track, and, it may be, on the way to fresh effort and initiative, was cut short and again scattered by the Dorian invasion, to begin its life over again, and, in a fuller and larger way, to work out its destiny, and yet permeate with its artistic instinct the country from which it was now expelled, has yet to be considered. Five barren centuries at least elapsed before the conditions favoured what may be called the reappearance of Achaean, henceforward to be named Ionian art. The more we dwell on the earliest periods of Greek art, the more shall we discover what it owed to the Aegean civilisation; and it is astonishing to find how many Aegean principles and motifs have survived. But the chief importance of the Mycenaean culture to a student of classical architecture is, not that the one was the direct ancestor of the other—for such an interpretation is not supported by the most recent discoveries—but the light that it throws on the origins of Greek architecture, as evolved by kindred tribes in the same environment, on the basis of the same fundamental traditions. It enables us to fill out the hazy background of the primitive period of Greek architecture, to retrace the development of the megaron plan, of the dadoes and antae of walls, of the inclined jambs of doorways. And even though we may admit that certain details, the bracket capital,

the Doric echinus, the fluting of the shafts, the rosette, the palmette, and the spiral, seem to have been direct survivals from the Aegean age, yet it remained for the later Hellene to exercise on them his refining genius and hand them down ennobled to future generations. In short, Aegean architecture, though earlier in date, was a parallel development, and not the immediate source of Greek architecture, the true fountain head lay rather in the earlier northern home from which came the successive Aryan invaders of Greece.

## CHAPTER II

### THE ORIGINS OF GREEK ARCHITECTURE

THE dispersion of the Aegean tribes at about 1100 b c , which was the beginning of the making of the living Greece of history, appears to have been brought about by disturbances in Epirus and Thessaly, from which regions numerous armed bands invaded central Greece and the Peloponnesus, driving the earlier inhabitants, Ionians, Aeolians, or Achaeans, to Attica and to Asia Minor. The chief motive of this invasion of southern Greece may safely be set down to plunder, the great repute of the wealth of Mycenae and kindred cities sufficiently accounting for the enterprise, which in many respects presents an analogy with the invasion of Roman Italy by the northern hordes. The "Return of the Heracleidae" was the fanciful term which the Dorian tribe afterwards gave to their occupation of southern Greece and subjugation of the real owners of the soil, assuming, wrongly so far as we can judge, that their own ancestors had been its original inhabitants. In overturning the Achaean civilisation these invaders, being by nature rude and unskilled, interrupted the progress of the arts, and threw back every development in this direction. But this stoppage was only temporary : as Perrot finely puts it, it was as if a fire which blazed brightly in the open had been smothered by a bundle of damp twigs ; the flame was quenched temporarily, only to burst forth again more warmly and clearly. So from the mingling of the conquered and the conquering races, after a lapse of three or four centuries, issued the Dorian Greek race of history, which, subsequently meeting again the Ionic element which meanwhile had been taking a different direction, was destined to produce in Athens the highest results in art which the world has yet witnessed. It will be one of the objects of this chapter to trace the origins of

the Dorian type, which characterised the architecture of European Hellas and the West.

Those whom the Dorians had displaced, the Achaeans, Ionians, and Aeolians, were in part pressed into the central highlands of Arcadia and the northern edge of the Peloponnesus (where they soon became subject to Dorian influence), or into Attica and Euboea, but the majority fled across the Aegean Sea to the Asiatic coasts and islands. Asia Minor, the borderland of Aryan and Semitic man, the threshold of Asia and the gate of the west, was then dominated successively by the Hittites and Phrygians, the star of empire setting ever farther westward ; it was not until 716 B.C. that Lydia as a kingdom began to play a part. But prior to this time the tribes thrust out of the Peloponnesus and central Greece had fringed the shore of Asia Minor with their colonies, seizing the shore land and the islands held of little account by the powers of the interior. Greek tradition records migrations of the Aeolians in 1124 and of the Ionians in 1044 B.C. ; and by the eighth century Ephesus, Miletus, Smyrna, Erythrae, Phocaea, were already great cities, and were rivalling Tyre and Sidon, whose civilisation they were so largely to displace. It was in Cyprus that fugitives from the Peloponnesus came into direct contact with the Phoenicians, collaborating in the foundation of colonies on the ruins of the Aegean culture. The swift rise of these Ionian centres is one of the most striking things in the history of the Aegean ; it was in great measure from them that the fine arts and philosophy, modified yet invigorated by fresh contact with the Oriental types of civilisation, passed back again into European Hellas.

Other bands had turned in the opposite direction, Eretrians of Euboea established a half-way station at Corcyra, and from Chalcis in Euboea went colonists to Cumae in southern Italy as early as 1056 B.C., and afterwards to neighbouring sites, Naples, Pompeii, and Rhegium. There is no mention of the Greeks in Sicily earlier than about 735 B.C., when Naxos was founded by another Ionian colony from Chalcis ; others came to Syracuse ; from Cumae was settled Zancle (Messina), from Naxos spread Catana and Leontini ; and Ionians predominated in the settlement of Himera even as late as 648 B.C.

A third movement was toward the north, where the Black Sea was soon fringed with Ionian colonies, sent especially from Miletus

and Phocaea, while the Euboeans devoted special attention to Macedonia.

Whatever may have been the impulse that brought the Dorians and the associated tribes into the Peloponnesus, it was land-hunger doubtless that soon sent them swarming out of it. From every part of Greece they followed their fleeing Mycenaean predecessors, and passed into Crete, the southern Cyclades, Cos, and Rhodes, and even settled in one or two cities on the Asiatic mainland. A later wave of Dorian migration, in the last third of the eighth century, followed the other Ionian remnants who had passed westward. Dorians of Corinth wrested Corcyra and Syracuse from the Eretrians and Chalcidians in 734; others from Megara settled Megara Hyblaea in 728, the Laconians appeared at Tarentum in 707, and the Rhodians established Gela in 689 B.C. Other colonies in turn hived off from these, the Megarians founding Selinus in 628, the Syracusans settling Acrae and Camarina, while the last of the important colonies was that planted by the Gelonians at Acragas in 581 B.C. These Greek colonists of Sicily succeeded in placing under subjection the earlier inhabitants of the eastern part, the Sicels, from whom the island derives its name, and the Phoenician trading posts which had previously occupied this part of the coast were forced to withdraw to the territory of the Sicans and Elymians to the west. But the colonists who occupied the heel of Italy were constantly at war with the inland barbarians, especially the Illyrian tribes (Calabrians, Messapians, and Japygians).

\* \* \* \* \*

Before considering the development of Greek religious architecture, it may be noted that the religion was a combination of the personification of natural phenomena with that of deified heroes or ancestor worship. The Mycenaean tribes, especially the Cretan, seem to have worshipped a supreme goddess (Rhea), and when they went over to Ionia in Asia Minor, they found that there, too, the Phrygian religion was that of a great goddess, Cybele, the mother of the gods, the patroness of all fertility. But the earliest records of the primitive European Greek religion point to a worship of Zeus, the supreme god. These two beliefs appear to have mingled, and the number of Greek gods rapidly multiplied and became legion, they married and begot offspring innumerable, and in the different localities the ingenuity of the priesthood soon determined the special worship of a certain god or

gods without regard to the worship of that same god or gods as practised elsewhere in the Greek world. In some such way it came to pass that the favourite dwelling-place of Zeus was supposed to be at Olympia, of Hera at Samos and Argos, of Athena at Athens, and of Apollo at Delos and Delphi, while the Asiatic mother-goddess was nationalised as Artemis (Cybele) at Ephesus and near-by Sardis, and as Aphrodite (Astarte) at Paphos in Cyprus. Zeus, Athena, and Apollo may be instanced as constituting the greatest triad of the Greek gods, each embodying to the Greek mind one of the forces of nature. Zeus was ruler of earth and heaven, the god producing storms, darkness, and rain, Apollo was the "shining one," the sun god; Athena was the queen of the air, worshipped in a variety of aspects and especially at Athens as Pallas-Athena, the goddess of wisdom. Then there were Demeter, the goddess of agriculture, Dionysus, the patron of wine and of the drama; Poseidon, the sea-god, Hephaestus the god of fire, Hermes, the messenger and herald of the gods. These examples will be sufficient, for it would be impossible to do more than give a general idea of the nature of Greek mythology, which was largely the idealisation of God's mysterious workings by people who in spite of, or because of, their healthy animation were full of sensitive and earnest imagination. Beautiful scenery affected the Greeks in a religious way, for they were keenly susceptible to the permanence of spirit-life in Nature, and to them the mountain, the water, and the wood were peopled with divinities. If landscape touched them at all artistically, at least it did not lead them to pictorial representations, but solely to this personation and deification. Numbers of cults, in addition, were created out of the admiration for the prowess displayed by heroes of the same clay as themselves, and, as in modern days, honours were paid to these deified mortals and pilgrimages were made to their shrines.

The artistic feelings of the pious Greeks led them not only to express the symbolic meaning, attributes, history, and achievements of their countless gods in sculpture, but also to surround their sacred statues with quantities of votive offerings of every description—in this way the buildings dedicated to their divinities were decorated and furnished, and a wide field was opened to the artist and a magnificent opportunity given to the development of art. Earth and sea and sky, mountain rocks and valleys, rivers, groves

and forests, which the Pantheism of the Greeks personified and idealised, had to be represented in sculptural form. The earlier statues were rude and primitive images (*xoana*) carved in wood, and even down to a later day, when the buildings were of marble, the great chryselephantine images of Zeus, and Athena, and Poseidon were in wood, albeit overlaid with gold and ivory. The beautiful material which Naxos, Paros, and Mount Pentelicus yielded could not, however, long be ignored, and the introduction of hollow-casting from Egypt opened another field for art. As far back as we can trace the primitive temple, so far we can trace its accompaniment of votive offerings, marble or bronze statues of the god, or of the donor who thus dedicated himself symbolically to its service.

It is extremely probable that the earliest covering provided for the Greek cult image, or *xoanon*, was little more than a hut which served the material purpose of shelter. But it was not in the nature of the Greeks to be satisfied with this, and it was necessary to give the tabernacle the character and spiritual significance of a god's house. Mere advances in construction do not account for the development of the shrine, it is of the aspiration of humanity toward something fulfilling their ideal of a house of God that the Greek temples speak. Building better than they wot of, one generation joined hands with another in rearing these most splendid fabrics of in-dwelling divinity. In nothing more than in religious buildings does architecture point out so clearly the pathway of the spirit, the slow and painful ascent of "the world's great altar stairs that lead through darkness unto God."

As a rule temples dedicated to gods had the statue looking eastward toward the rising sun; and therefore the principal entrance faced east.\* All the great temples had a vestibule (*pronaos*), a large habitation (*cella* or *naos*) for the idol which was so placed as to face the entrance, and sometimes a chamber in the rear used as the treasury of the priesthood, as well as the rear porch (*opisthonaos* or *opisthodomus*, *posticum*)† enclosed with gates and used for the same purpose. The whole was frequently

\* There is no authority for the oft-repeated statement that the temples of heroes, on the other hand, faced westward.

† In the second edition of this work the term "*epinaos*" was used on the analogy of "*pronaos*", but since this word is not found in any classic author it seems preferable to retain the recognised ancient term "*opisthodomus*".

surrounded by a portico or peristyle, so that it became a peripteral temple. The pronaos and opisthodomus frequently housed images and votive offerings, serving the purpose of the treasury, and were enclosed by metal railings and gates. The altar, which in early times stood in the open air, continued to be placed in front of the temple in the open, while in the interior a small offering table stood in front of the image. These open air altars (round or oblong in shape) were built of stone or marble and raised on steps, and they had appropriate inscriptions and were decked with flowers. It is possible that in most cases the interior of the temple was open to privileged persons only, and that the one view which the people had of the god (except perhaps at festivals) was from the open doorway, to the east, at sunrise, when the light would dimly illuminate the great statue, and one can under such circumstances have some idea of the awe and sense of mystery inspired among them by such a view of the image of Zeus or Athena. On the occasion of festivals or processions, the excitement of the moment could be counted on to neutralise the contempt which greater familiarity with the lifeless symbol might inspire.

It was long, however, before such a complex organism as the peripteral temple with all its parts, and the formal columnar orders, came into being. The earliest temples of the gods, in all parts of the Greek world, were merely the houses of men, enlarged and embellished. The gradual evolution from apsidal to rectangular plans was now repeated. The earliest examples were quite without columns. These first appeared in the interiors (Figs 12 and 16), to assist in supporting the ceiling and roof when the walls were too far apart to permit the use of simple transverse beams, then they were repeated on the facade, forming an open portico or pronaos *in-antis*. The peristyle which was eventually added all round this simple form of temple may have been suggested by the desire to give a better protection to the walls of crude brick. In this way the Greek temple gradually assumed its characteristic columnar form and embodied the fundamental principle of Greek architecture, the post-and-lintel system. With the advent of the column, it became necessary to evolve the order; and from the different manners in which this was accomplished simultaneously, on the opposite shores of the Aegean Sea, developed the two great styles of Greek architecture. In the lands occupied by Dorians the Doric order was the first to make its appearance, and was

almost exclusively used, while on the coasts occupied by the Ionians and kindred tribes we do not seem to have Doric buildings until a late period, when they do indeed occasionally appear, although the Ionic still predominates. The Ionic order, using the well-worn phrase in its widest sense, although placed after the Doric in our scheme, should not on that account be regarded as later; we wish to emphasise the fact that its development was co-extensive in time, and that it was not a form which replaced the Dorian style. Rather, as we shall afterwards see, they may both have come out of the same root in the soil of Mycenae. Hence the differing treatment became not only a symbol of the two greatest divisions of the Greek race, whose rivalry makes the

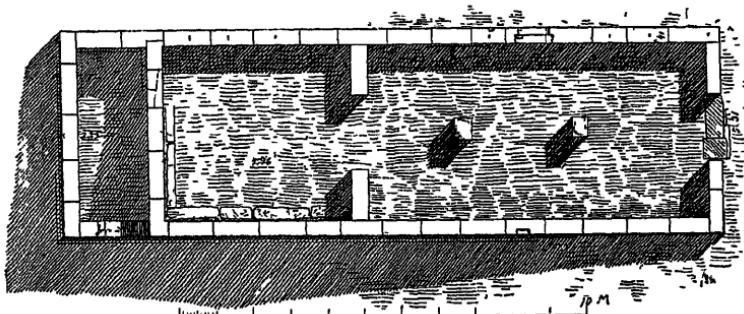


FIG. 12.—THE MEGARON ON THE ACROPOLIS AT SELINUS

history of Greece, but also the happiest and most expressive symbol we could have, speaking to us, on the one hand, of the grave, severe, all-sufficient Spartan, in whom Dorian culture approached its ideal, and, on the other, of the lighter, more versatile, frivolous, and superstitious semi-Asiatic colonist who stands for the type of the Ionian race farthest removed from the Dorian

\* \* \* \* \*

On the Greek mainland, one of the earliest peripteral temples of which remains have been found sufficient to determine its approximate restoration is the temple of Apollo at Thermum in Aetolia (Fig. 13), with five columns on the fronts, fifteen columns on the flanks, and a single row down the centre of the cella in order to carry the roof. The cella walls were of unburnt brick. Only the footings of the columns were of stone, the columns

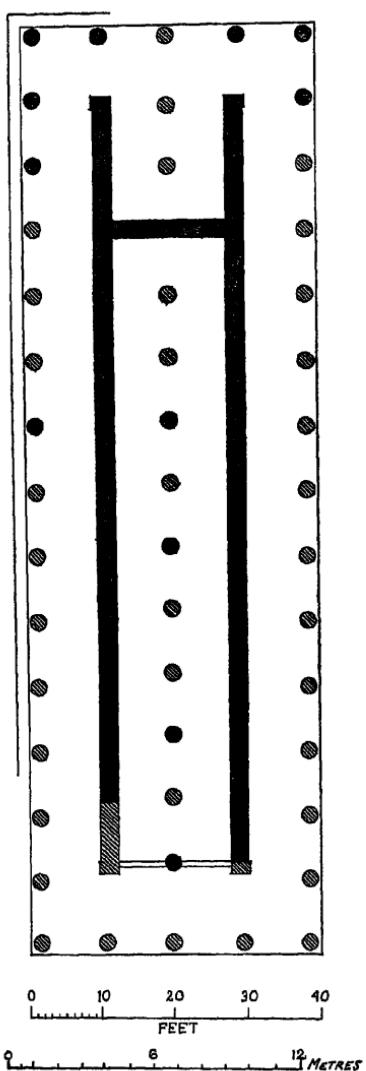


FIG. 13.—THE TEMPLE OF APOLLO  
AT THERMUM.

of the plan, in particular the corners, a feature which was still unknown at Thermum,

themselves were of wood, and so, too, was the entablature, but of the latter, fortunately, much of the terra-cotta revetment is preserved, including the great painted metopes which prove that the temple was Doric in style (Plate XV) A more developed peripteral example was the archaic temple of Hera near Argos, with hexastyle facades, but of this exists only the stylobate or continuous step supporting the colonnade, important however on account of the weathered traces of the wooden columns, 2 feet  $7\frac{1}{2}$  inches in diameter.

The most notable of all the early Doric peripteral temples is the Heraeum at Olympia (Fig. 14, Plate XXIV H). The date of its foundation was attributed by Pausanias to the beginning of the eleventh century B.C., but certainly on fallacious grounds, at that early epoch no temples were as yet being erected, and the Heraeum, furthermore, is the last of three successive temples on the same site, so that its date must have been considerably later than 1096 B.C., we should prefer rather the end of the seventh century. Such a date is more in harmony with certain well-developed features

and did not make its appearance in the western colonies until the very end of the sixth century. The general proportions, however, are still very long, the relative proportion of width to length being about 2 to  $5\frac{1}{2}$ , whereas in more developed Greek temples it was about 3 to 7; there are six columns on the front and sixteen on the sides, and it stands on a stereobate of only two steps (the stylobate and one below) instead of the usual three. The wide intercolumniation shows that the architrave was in wood; that the columns were originally in the same material is suggested, firstly, by the existence of one oak column in the rear porch, the opisthodomus, as related by Pausanias, and, secondly, by the fact that the present columns vary considerably in their diameter and their character (Plate XV). Some of the shafts are monolithic, others built of drums; and the echinus of the various capitals differs in contour and projection; all these facts point to the conclusion now generally accepted, that the original wooden columns were replaced gradually by those in stone. The use of wood, however, was due not so much to the early date (for at this epoch stone temples were already being erected elsewhere) as to some peculiar local tradition. The form of these earlier wooden columns is unfortunately quite unknown.\* The walls of the cella

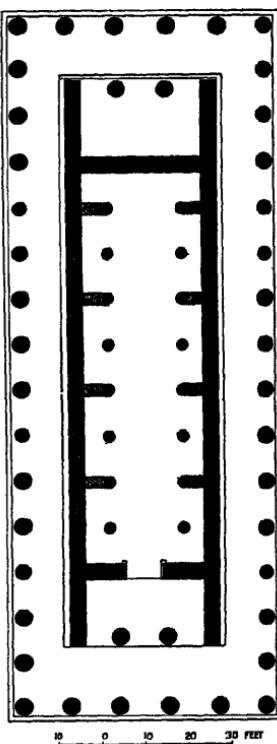


FIG. 14.—THE HERAEUM  
AT OLYMPIA

\* In the second edition of this work it was suggested that they tapered downward in accordance with the Mycenaean precedent, and, assuming that the upper diameter was the same as in the earliest stone column, 3 feet 2 inches, the lower diameter was estimated as about 2 feet 10 inches. It was also suggested that under these columns were stone bases of Mycenaean type worked on the stylobate, but the latter suggestion, at least, seems most improbable.

were of great thickness, the base consisting of four narrow courses of masonry to the height of 3 feet, their exterior face toward the peristyle being protected by vertical slabs of stone, following the traditional Greek custom of having this dado of vertical slabs, known as orthostates, outside the cella walls (*cf.* Plate XXXVI), and on this base or socle rested a superstructure of crude or unburnt mud brick.\* Here also, as in the Mycenaean buildings, the ends of the side walls of the pronaos and opisthodomus were encased with timber in order to carry, in conjunction with the columns in-antis, the architrave and superstructure, and the jambs of the doorway leading to the cella were similarly encased. In the interior of the cella, on either side, was a range of eight columns to lessen the bearing of the main beams carrying the horizontal ceiling and the sloping roof over the cella,† in order to dispense with the support of the crude brick walls. These columns would seem to have been alternately attached by spur walls to the cella wall to give further strength to the latter. The roof was covered with terra-cotta tiles, with cornice revetments, acroteria crowning the pediments, and antefixes terminating the cover tiles, all richly painted in dark colours. But, with the exception of these terra-cottas, nothing of the superstructure of the Heraeum has come down to us, the entire entablature and roof, as indeed we deduced from the plan, were of timber construction, and we can restore their forms only by conjecture. Thus, while the wide intercolumniation at this early date shows that the architrave must have been of wood, the closer intercolumniation of the columns at each angle suggests the presence of a frieze, with triglyphs and metopes, for the only explanation of such a contraction is that it was introduced in order to bring the triglyph to the corner.

At this point we may terminate our survey of the primitive Doric or Proto-Doric temples, by calling attention to some disputed questions relating to this subject, and the manner in which they should now be viewed.

\* It is to the latter that we owe the preservation of the statue of Hermes by Praxiteles, which was found buried in the clay of the disintegrated walls at the foot of its pedestal.

† The existence of a ceiling under the sloping roof is suggested by a story told by Pausanias, in which he says that "when the Eleans were repairing the dilapidated roof of the Heraeum the corpse of a foot-soldier was found between the ceiling and the roof."

(A) We have sufficient evidence to show that the column, in its earliest stages, was of wood like those of the Aegean period, but whether the shafts were perfectly cylindrical, or tapered upward or downward, we have as yet no idea.\* And, while our knowledge of the forms of their wooden capitals is equally indefinite, yet we may reasonably conjecture that they had, like those of stone which followed them, the characteristic abacus and echinus, obviously a derivation from the Aegean type, which must have been well known to the Dorians through the stone copies on the Lion Gate (Plate X) and the Tomb of Agamemnon (Plate XI). Perhaps the cavetto above the echinus was omitted at an early date, for we see no trace of it in the earliest existing Doric capitals; the scotia and astragal below the echinus, on the other hand, survived until a later period and prove the relationship between such capitals as those at Paestum (Fig. 25) and their Aegean prototypes. It has been suggested, however, that the wooden columns of primitive Greek architecture had no relationship to the Doric column, and that the latter was imitated rather from certain Egyptian stone columns, to which, to be sure, it bears a superficial resemblance. But the heavy proportions of the earliest known Greek Doric columns of stone, little more than four diameters high (Fig. 21), and the fact that from the very beginning the echinus formed an essential feature between the shaft and the abacus, while the abacus was of much greater width than the upper diameter of the shaft, militate seriously against the theory that there was any connection between the Greek Doric column and the so-called "Proto-Doric" examples at Beni-Hasan or at Karnak and Der-el-Bahari in Thebes. It is hard to find a wider dissemblance than exists between the earliest Greek Doric columns and the Egyptian fluted columns, where the proportion in height varies from  $5\frac{1}{2}$  to 6 diameters, where there is no echinus and where the abacus slightly, if at all, exceeds the upper diameter of the shaft.† On the other hand, the well-known timidity of the Greeks

\* As stated above, there is no authority for the theory, put forward in the second edition of this work, that the shafts tapered downward in accordance with Mycenaean precedent, but it is, of course, quite possible.

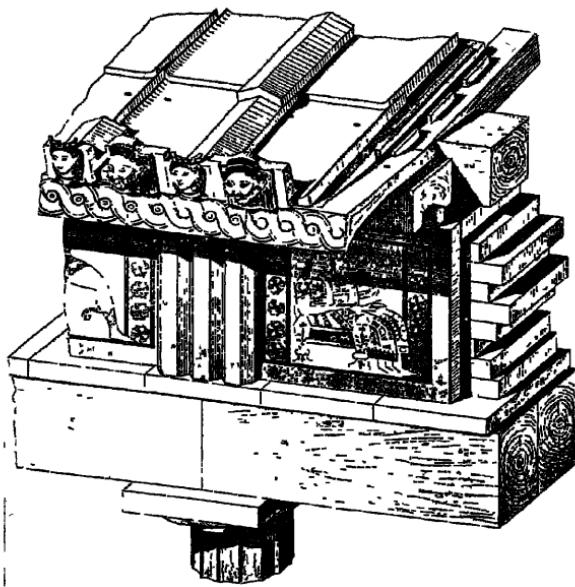
† There comes a further reflection, that if the Greeks copied one type of Egyptian column, why should they not have adopted others? At Beni-Hasan the lotus capital exists in the interior of many tombs, and at Thebes both the bud and the bell-shaped capitals are found in great profusion, yet the former never appeared in Greece, while the Greek examples of the bell-type formed an independent movement. Furthermore, the so-called "Proto-

in stone construction would be enough to account for the sudden thickening of the proportions when translating from a prototype hitherto of wood.

(B) The entablatures of these early temples having almost entirely disappeared, we are forced to trust to a few fragments of their terra-cotta trimmings (especially those of Thermum), to the archaic reproductions in stone of what were originally wooden features, and to the description of the primitive entablature as given by Vitruvius. And though the same controversy that we noted in the case of the columns, for an origin in wood or in stone, is being waged also with regard to the entablature, yet we may unhesitatingly affirm that the triglyphs in the frieze reproduce the ends of beams (Fig. 15) or the decorative grooved facing of the ends of such beams, secured in position by pins or pegs passing through the projecting taenia or fascia surmounting the architrave, and through the regula or short strip under the taenia, below each triglyph; the pins became the trunnels or guttae, still detached from the architrave in the earlier stone temples, and even sloping outward (as in temple "D" at Selinus). The mutules or projecting blocks on the soffit of the cornice are as clearly the ends of the rafters of the roof, likewise with pegs or guttae, and all the other details are easily interpreted as translations of wood or terra-cotta members into stone, the metopes being the terra-cotta facing of the brick walls between the triglyph beam ends. Whilst the mutules and their interspaces always continued to represent the approximate slope of the roof in the peristylar temple, the triglyphs gradually came to be employed only in a decorative sense, as they did not correspond to the cross beams of the peristyle ceiling, which were at a much higher level. This, however, was merely the result of the translation of the entablature into stone, the primitive wooden form was probably quite consistent, the beams coinciding with the triglyphs, and even in later stone architecture we have examples of such coincidence, as in the eastern portico of the Propylaea of the Athenian Acropolis (Plate XLVI).

(C) Finally, with regard to the plan as a whole, we must refer to the well established theory that the structure within the peristyle, that is, the cella and pronaos, is a direct derivation from the Mycenaean megaron (Plate VIII). So long as the Heraeum at Olympia

Doric" column ceased to be employed in Egypt after the eighteenth dynasty, more than six hundred years before the earliest Greek stone columns



ENTABLATURE OF THE TEMPLE OF APOLLO  
AT THERMUM (RESTORED BY KAWERAU).



CORNER OF THE HERAEUM AT OLYMPIA, WITH REBUILT COLUMNS.



CYPRIOTE STELE (METROPOLITAN MUSEUM).



DOOR JAMB OF TOMB AT TAMOSSOS, CYPRUS.



PROTO-IONIC CAPITAL FROM LARISSA (CONSTANTINOPLE MUSEUM).

was our earliest example of primitive Doric architecture, such an explanation was the best method of bridging the gap, but now that the Heraeum has been assigned rather to the end of the seventh century, while on the other hand numbers of temples intermediate between the Mycenaean megaron and the Olympian Heraeum have come to light, we see that the farther we recede toward the darkness of the Dorian invasion, the more elemental the plan becomes (Fig. 12), resembling more the primitive ancestor of the Mycenaean megaron (Fig. 4) than the developed product. The long rectangular plan, the

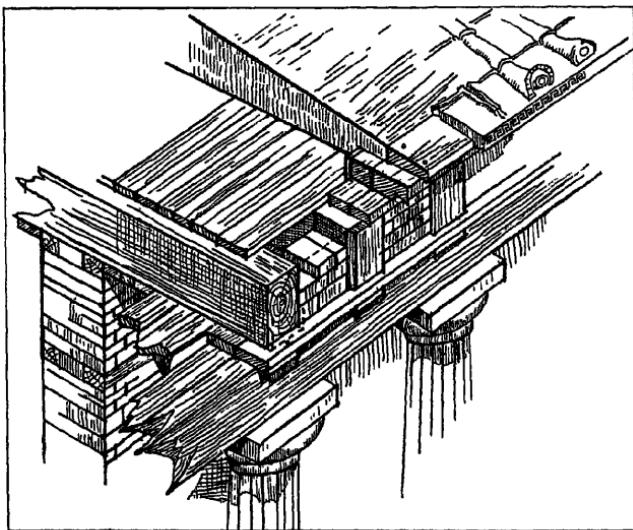


FIG. 15.—CONJECTURAL RECONSTRUCTION OF PROTO-DORIC ENTABLATURE (Durm)

use of a socle of rubble masonry (eventually replaced by orthostates of stone), in order to raise the mud brick walls above the foot-worn or rain-washed ground, the timber casing of the antae and door jambs where the mud brick alone would have been too weak—all these were merely the logical development of the ideas which the Dorians, like the Achaeans before them, had brought from their northern homes. The colonnaded pronaos of the Greek temple, the most "Mycenaean" feature, did not appear in Greek architecture until long after all memory of the Mycenaean palaces had died away. The house of the Greek god was an independent

growth, related to that of the Mycenaean king only in its common ancestry.

\* \* \* \* \*

In order to trace the origins of the other order, the Ionic, we must change our vantage ground from Europe to Asia, thus following the footsteps of the Mycenaeans, the Ionian and Aeolian tribes, whom the migration of the Dorians at about 1100 B.C. drove out of the Peloponnesus and part of Central Greece.

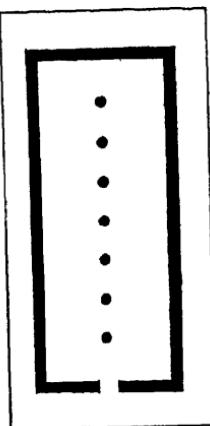
The characteristics of the Ionic order are by no means summed up in the capital, nor even in the column itself, but it is natural to deal first with the member that has always been regarded as

the index mark of the style. The obviously reasonable position to take is that not one cause, but many, contributed to produce this graceful and ornamental form. Few, if any, architectural features can be attributed to one cause alone; practically all can be traced back to a combination of impulses. But in the case of the Greek Ionic capital one fact at least seems plain: the farther back we go in our study, the more probable appears the theory of a wooden origin, the spirals being originally merely painted or scratched on the surface of the block which served as a bracket capital to diminish the span of the lintels. Such scratched spirals, though of later date and executed on marble,

FIG. 16.—THE TEMPLE  
AT NEANDRIA

have actually been found at Athens (Fig. 39).

It is among the most orientalised of the Hellenes, those of Cyprus, that we can best trace the various stages of the transformation of the Egyptian lily capital into that conventional form which we know as Ionic. For among the Cypriote monuments this form, with two volutes springing vertically from a triangular base, and with a palmette filling the angle between the volutes, can be traced back to the beginning of the iron age, when the island had been for some centuries under Egyptian domination. Egyptian decorative capitals frequently represented the papyrus superposed on the fleur-de-lys; and it is this type, with the calyx of the lily conventionalised in triangular form, and the papyrus stiffened and



reduced to form a palmette, that we must regard as the source of the Proto-Ionic capital. In Cyprus, the type seems to have been confined to square piers or stelae (such as a sixth century example in New York, Plate XVI), or to the jambs of doorways (such as that of a tomb at Tamossos, Plate XVI); it was only in Asia Minor that it was applied to round shafts.

True examples of Proto-Ionic capitals are found in temples at Neandria in the Troad (Fig. 17) and at Nape (Kolumnado) in the island of Lesbos, and also at Mitylene in Lesbos and at Larissa near Smyrna (Plate XVI). In all these, the spirals of the volute rise vertically from the shaft and spring outward, the triangle between the volutes being occupied by a great palmette; the eyes of the volutes are often bored through. Below the volutes, and binding them together, is a great torus decorated with leaves, or a group of smaller mouldings; and below this again is a pendant girdle of overhanging leaves, the serrated lower edge isolated from the shaft by means of a deep cavetto. Another example of this lowest member, apart from those at Neandria and Larissa, has been found at Aegae.

By the end of the primitive period the girdle of pendant leaves, the lowest member of the Proto-Ionic capital, seems to have been eliminated. We find it surviving only in the Persian imitations of Greek work at Persepolis\* and Susa, and in a modified form in the bell capitals of the Aeolic treasuries at Delphi. The vertical volutes, too, outside of Cyprus, survived only in the above-mentioned Persian imitations and in some fanciful Ionic capitals.

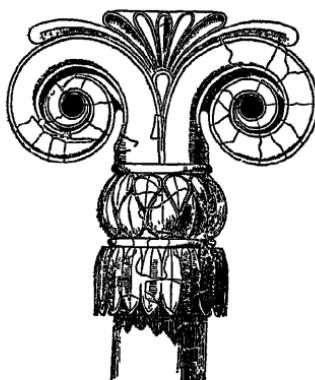


FIG. 17.—PROTO-IONIC CAPITAL  
FROM NEANDRIA  
(Constantinople Museum)

\* The great halls at Persepolis, in which the columns were decorated with the Ionic volutes placed vertically, above the calyx with pendant leaves, were not built until 520-485 B.C., so that these features, which might otherwise seem to have been the models for the Greek Ionic capitals, were in reality copied from them. The architects of the great halls of Darius and Xerxes, besides other treasures, would seem to have utilised also in their design architectural features imitated from the Greek coast cities.

of archaic votive offerings, but in Cyprus the vertical volutes continued to form the characteristic capitals

Already, in these primitive examples, others of the chief characteristics of the Ionic column have become apparent. One of the most distinctive marks of the Ionic style is the individual base; for, while the Doric column rose directly from the continuous stylobate, the more slender Ionic column required a base of its own, for a greater effect of stability, and it also admitted of a projecting base because of the wider intercolumniation. Such bases, already with the characteristic torus, appear in the temple at Nape. The Ionic shaft appears always to have been very slender, even when translated from wood to stone. Of fluting there is as yet no trace.

While we have actual remains of the columns, we have nothing of the Proto-Ionic entablature, and must, as in the case of the Doric entablature, proceed to derive it from later copies in stone. It is certain that the architrave, instead of having the high face of the Doric, must always have been triply divided and stepped into fascias, like later copies in the tomb and palace of Darius and other Persian examples, or in the native tombs of western Asia (Plate XVII, Fig. 18). It apparently was built up in several courses of timbers, each corbelled or projecting forward to secure a wider bearing for the roof. The ends of the square roof timbers, not only in Asia Minor but also in Persia, were allowed to appear on the exterior, and constituted as dentils one of the most important decorative characteristics of the Ionian and Persian styles, but they were gradually reduced in dimensions, and were retained chiefly to give support to the projecting cornice. They represent the ends of the ceiling joists, and in the original form of the entablature were laid directly on the architrave, forming the under part of the cornice, but in the final arrangement, after the introduction of the frieze (which was not included in the original Ionic entablature) below the dentils, the actual beams of the ceiling, continuing to rest directly on the architrave, were far below the dentils which purport to represent them on the exterior, just as the Doric beams, on the other hand, were normally above the triglyphs. For the general form of the Proto-Ionic entablature the clearest impression may be gained from the tombs of the native Asiatic races, especially the Lycians, reflecting the influence of the Greek colonists who had settled in their territory.



Of the earlier kingdoms in Asia Minor which were bordered by the Greek colonies, those of Phrygia, Lydia, and Lycia are the most important so far as their architectural remains, chiefly sepulchral monuments, are concerned. For our present purposes, however, the Lydian tombs are of the least importance, because, of the two classes of which they are composed, the most monumental examples are of the tumulus form in which there was little to influence the development of Greek detail, while the rock-cut tombs are more crudely worked and gave little opportunity for refinements of design. In Phrygia, on the other hand, the rock-cut tombs assume greater importance, and some are of special interest because they repeat the symbol of the Lion Gate at Mycenae; these rock-cut tombs show it to have been a common design in these parts, and as the examples discovered are of later date than those of Mycenae they probably represent the influence of the Ionic immigrants. Another class of Phrygian rock-cut tombs is that which has a square front in one plane (such as the tomb of Midas), decorated with patterns suitable for a woven fabric, and believed to be a reminiscence of the movable tent—the house of the nomadic tribes. There was thus a tendency in primitive architecture to perpetuate forms which were matured in phases of life preceding those of the erection of durable architectural works.

In Lycia we meet with a parallel class of rock-cut tombs, that of the wooden hut sculptured in the rock, with all its beams and poles, its mortises and pegs—an imitation so close as to be unmistakable. It is from such tombs that we obtain, as noted above, the best evidence for the form of the Proto-Ionic entablature; though in actual date these tombs are by no means all primitive, since in this inaccessible territory the traditional forms prevailed until Hellenistic times. At Myra, the ancient capital, there is an imposing group of these cliff dwellings of the dead on the mountain side, and others exist in hundreds in this south-western corner of Asia Minor, as a rule cut in the sides of cliffs. Broadly speaking, there are three types. The oldest are those forming direct copies of framed timber houses, generally having horizontal cornices (Plate XVII). The entablature is composed of the double or triple fascia of the architrave, representing two or three tiers of beams, there is no frieze, the horizontal cornice is supported by round disks, representing the ends of roof poles or unsquared logs laid

side by side, such as are shown above the pillar of the Lion Gate at Mycenae, in the original hut they carried the flat mud roof, and in the rock-cut tombs of Lycia they are of the same dimensions as the original wood beams that they represent. Later we find the ends of squared logs occupying this position, and these squared

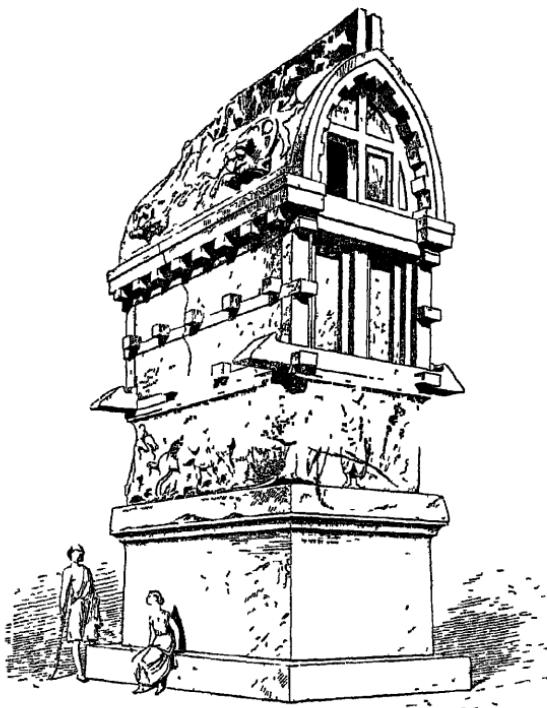


FIG. 18.—TOMB OF PAYAVA FOUND AT XANTHUS.  
(British Museum.)

timber ends were carried over into monumental architecture in stone retained probably to give support to the projecting cornice, but reduced in dimensions, and constituting as dentils one of the most important decorative characteristics of the Ionic style. The third type of tomb consists of those in which the design was largely influenced by the stone architecture of the neighbouring Greek cities; this influence is clearly shown in the Lycian Ionic tombs, the principal examples of which are found at Xanthus,

Telmessus, Myra, Pinara, and Antiphellus. In these the front of the tomb carved in the rock is copied from a portico in-antis with Ionic columns, but with some details reproduced from the earlier wood structures native to the country

Yet a third class of monuments is met with in Lycia, those of the sarcophagus type, of which two of the best examples are in the British Museum (Fig. 18); and these are not less wooden in their origin—at least, so far as regards their upper parts—though they are probably of later date. Some are rock-cut and some are constructed, but in general they consist of a sarcophagus with a pointed curvilinear roof, apparently copied from a portable ark or shrine, the staves or beams for carrying it being carved in full relief. It rests on a podium, sometimes double, with the upper portion carved with a continuous frieze of figures; a fine example is the tomb of Payava (375-362 B.C.) from Xanthus. The upright posts and framing, the end pieces fixed by a wood key, the checking down of the cross beams, the ceiling joists appearing at the sides, but not at the ends, the planking of the roof—every detail represents wood construction perfectly, and the whole effect is that of a wooden cover to a sculptured stone sarcophagus; yet it is all of stone. It is worth noting, too, that it seems to represent ship rather than hut construction, and this not unnaturally, for Lycia fringed the south coast of Asia Minor, and the Lycians were a sea-faring people; a boat turned upside down on the beach might have suggested the upper part. The opening was doubtless for the introduction of the body. The reliefs and the inscriptions are of doubtful interpretation. Here again is a suggestion of the origin of the Greek dentils, and it will be seen how similar in many ways was the treatment of the cornice in the island of Cyprus (Plate XVI), which lies right off the coast of Lycia, and which combines in a singular way the characteristics of Egyptian, Phoenician, and Lycian art.

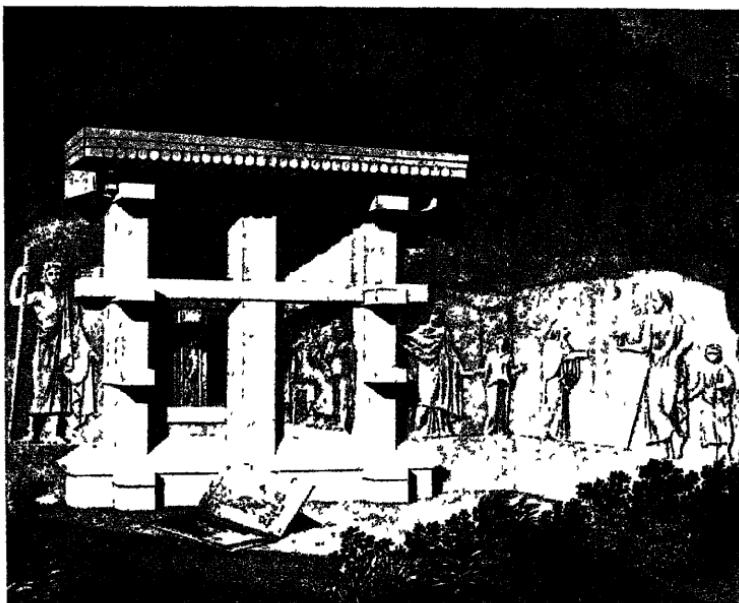
### CHAPTER III

## THE RISE OF THE DORIC STYLE

WE have outlined in a preceding chapter the story of the foundation of the Greek states in European Hellas and of their colonies in the west, and it is now the further development of these cities, and of their architecture, that we have to discuss, particularly with reference to the sixth century B.C. A most astounding feature of this period is the comparative insignificance, in an architectural sense, of the mother country, as contrasted with the almost unexampled prosperity of the western colonies. In many ways they outstripped the mother country in the race, and their reactive influence on Greece proper is very clearly traceable. It was much as it is to-day with Europe and America, America, the offshoot of Europe, outrunning the mother countries in many things, but awakening them by its reactive influence to fuller life, and enriching them with the fruits of its rapid and brilliant development. The art of Athens, as we know it, would have been impossible but for the earlier developments of Dorian Sicily, Magna Graecia, and the Peloponnesus on the one hand, and of the Ionian cities of Ephesus and Miletus on the other.

Each of the great cities of this time was a separate commonwealth, and often, though the general tendency was democratic, the power during the sixth century at least was in the hands of kings or "tyrants". Not only traditional kingdoms such as Sparta, but also republican cities such as Athens, Corinth, Syracuse, and Acragas were under the sway of such men, in whose hands accumulated the wealth drawn from subject cities within the sphere of influence of the various capitals. The early architectural monuments were largely the work of these men, structures through which they strove to show ostentation or to conciliate the people to their rule. This tendency prevailed throughout the sixth century, the archaic period pure and simple. After 500 B.C. we have

PLATE XVII.

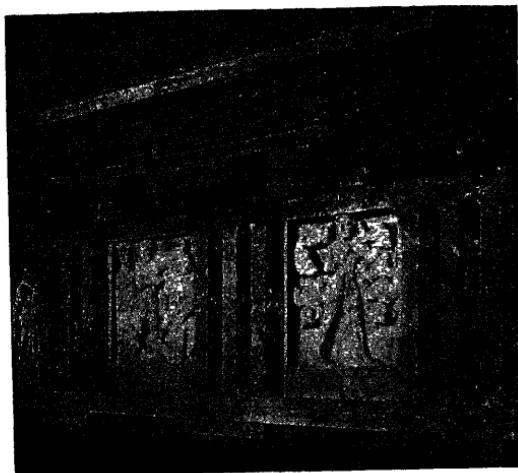


ROCK-CUT TOMB AT MYRA.



RUINS OF TEMPLES 'E R,' 'F S,' AND 'G T,' AT SELINUS.

PLATE XVIII.



ENTABLATURE OF TEMPLE 'C' AT SELINUS  
(PALERMO MUSEUM).



THE SO-CALLED BASILICA AT PAESTUM, SHOWING CENTRAL  
COLONNADE OF CELLA.

a period of preparation, a transition toward the culmination. The chief impulses which led to the great constructions of the early part of the fifth century were due not so much to the pride of rulers as to public patriotism. The defeat of the Persians at Marathon in 490 B.C., the second series of defeats at Salamis and Plataea a decade later, simultaneously with the defeat of the Carthaginians at Himera, greatly enheartened the Greeks both of the mainland and of the west; for in this respect the Persian and Carthaginian wars were beneficial, in that they aided the development of race feeling, and led the Greeks of the Sicilian cities, as well as those of Greece proper, to act together in the face of a common danger as they had never done before. Besides the wealth and influence which these victories brought them, the desire to commemorate these great achievements by monumental buildings and elaborate votive offerings had no small share in the subsequent artistic developments. To these transitional monuments we shall return later on; for the present we must review the earlier examples of the Doric order and endeavour to follow their gradual development.

\* \* \* \* \*

Of the Dorian colonies Syracuse was the greatest. It was the largest city in Sicily or in the whole Greek world, with a population of 500,000 and a circuit of twenty miles; and on one occasion (413 B.C.) it shattered the navy and army of Athens, which never afterwards recovered its former prestige. It is here, in the temples of Apollo and Zeus Olympius, that we find some of the earliest examples of the Doric style in stone. The proportions of the plan (Figs. 19 and 20) show the characteristic extreme length of the early peristyles, with hexastyle facades, there are seventeen columns on the flanks. In these examples, however, the unusual length is partly accounted for by the additional portico two columns in depth which was added on the main front. Also may be noted the proportions of the cella, which, in the Olympieum at least,\* is very narrow compared with its length. In both cases stone was employed for the columns and entablatures, the columns being only a little over four diameters high, with monolithic shafts, and the capitals with a wide-spreading abacus above the echinus, so much so that in the temple of Apollo they are nearly contiguous (Fig. 21). These are the earliest known examples of peripteral temples in

\* The temple of Apollo has not been completely excavated.

stone, dating from the very beginning of the sixth century. And while it is not easy at first to account for the enormous diameter of the columns and their close inter-columniation, if, as is generally believed, they were copies of wooden originals, yet it is obvious that the new circumstances demanded a different treatment;

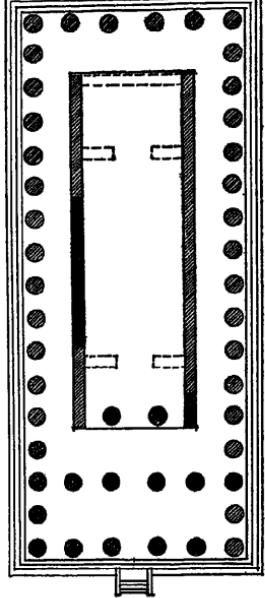


FIG 19.—THE TEMPLE OF  
APOLLO AT SYRACUSE

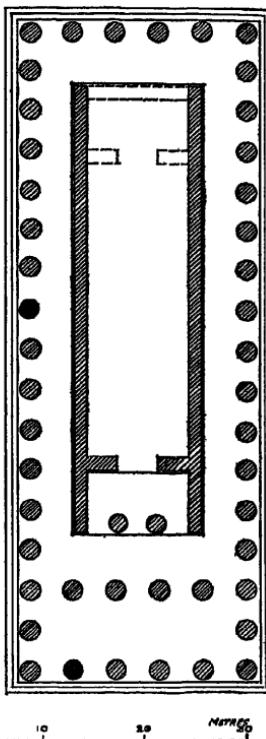


FIG 20.—THE OLYMPIEUM  
AT SYRACUSE

and the Greeks, who were always timid as to the bearing value of stone, preferred to err in the direction of excessive strength than of too little, and seem at first to have considered that the immense weight of the entablature required columns set close together, even, as in the temple of Apollo, less than a diameter apart.\*

\* In the illustration, the triglyphs on the front (shown at the left) should be wider, with those over the intervals between the columns omitted so as to leave horizontally oblong metopes as on the flank.

Next in importance was Selinus. Here we find six hexastyle temples, known as "A," "C," "D," "O," "ER," and "FS"; the magnificent octastyle example "GT"; and a prostyle temple "B" with a square cella, this being of a later date \*. The plans of all these temples are shown in Fig. 22. Those with the single letters lie on the Acropolis; those with the double letters are on the plateau about a thousand yards to the north-east. The temples are all in absolute ruin, having been apparently thrown down by

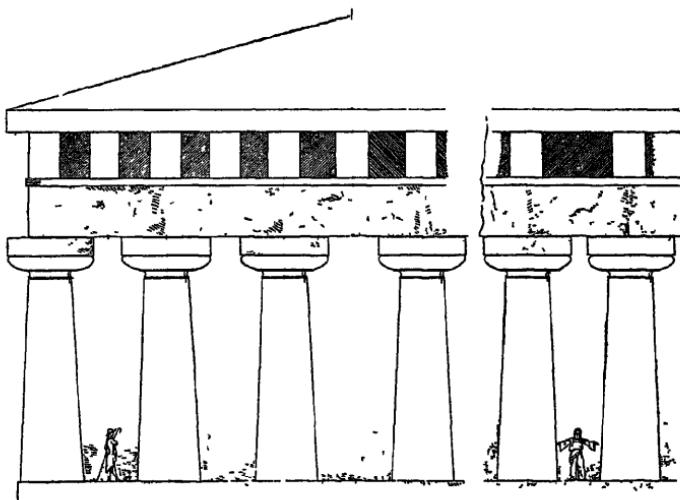


FIG. 21.—COLUMN SPACING IN THE TEMPLE OF APOLLO, SYRACUSE.  
(Durm.)

earthquakes (Plate XVII). They were built in limestone from quarries about seven miles from Selinus, and the whole of the stonework was covered with a fine coat of stucco to fill up the crevices of the aqueous limestone, and to obtain a greater refinement of detail in the profiles of the mouldings, with a view to the ultimate decoration with painting; and in many cases the stucco remains perfect with

\* The dedications of these temples being in most cases unknown, they are usually described according to the letters assigned them by Hittorff and Zanth in their work, *Architecture antique de la Sicile*, or according to those used by Serradifalco and preferred by Koldewey and Puchstein in their *Griechischen Tempel in Unteritalien und Sizilien*. The two series being respectively A, B, C, D, R, S, T and A, B, C, D, E, F, G (using O for the temple later discovered on the Acropolis), I have compromised in the manner indicated in the text.

the original colouring. Not only the columns, but also the entablatures and the cella walls were now executed in this permanent material, though with many survivals from the primitive wood and mud brick construction ; thus the walls, though now made of coursed ashlar masonry, still have the bottom course in the form of slightly projecting orthostates two or three times the height of the upper courses ; and the antae or terminations of the flank walls, forming responds to the columns in-antis, are thickened in imitation of the primitive wooden casing of the ends of the walls, while in the door jambs even the wooden casing itself survived and remained in use. With the exception of temple "O," all the temples were measured and reproduced by Hittorff and Zanth, and their description constitutes a most valuable record of the extent to which the Greek temples were enriched by colour , later studies, of a more scientific character, were those of Koldewey and Puchstein, and of Hulot and Fougères \*

The earliest example at Selinus is temple "C," of about 570 B C , hexastyle and with seventeen columns on the flanks, and with the double colonnade across the front, as in the two temples at Syracuse. The cella is extremely narrow in proportion to its length, and the pteroma or passage behind the peristyle is very deep, the cella walls not corresponding as in most hexastyle examples with the line of the second column from each corner of the facade. On this site were found the archaic metopes now in the museum at Palermo (Fig 23 and Plate XVIII), in high relief and extremely vigorous in execution, but lacking the dignity of the nearly contemporary Ionic sculptures of the archaic temple of Artemis at Ephesus. The relief which represents a chariot and four horses (quadriga) in front view is most remarkable, because the foreshortening was so difficult, and to give the sculptor more scope this particular metope has been sunk to nearly twice the depth of the others ; another metope represents Perseus beheading the Medusa. Their chief interest lies in the fact that they are among the earliest known Greek sculptures on a large scale, and that it is to such comparatively uncompromising beginnings that we owe the origin of the metope sculptures of the later Doric temples † On account of the narrowness of the

\* See the Bibliography

† The metopes at Selinus have not, however, the crudity of the stele of Chrysapha near Sparta, where the sculpture is worked on a series of receding planes, the face of each plane being kept quite flat

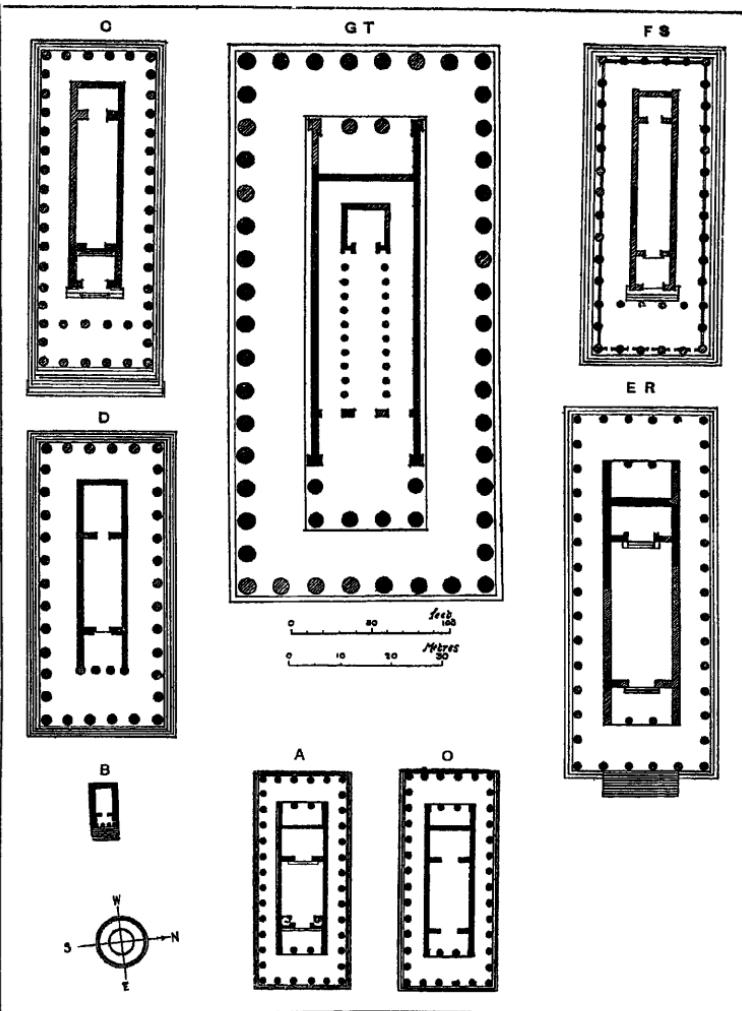


FIG. 22 — PLANS OF THE TEMPLES AT SELINUS, SICILY.

The outline sketches (on left) indicate the position of the temples on the Acropolis, and (on right) those situate in the plain.

D

C

B

A

O

G T

F S

E R

metopes, the mutules above them are also narrow, alternating with the wide mutules above the triglyphs, a characteristic feature of these early cornices. Temple "D," of slightly later date, shows

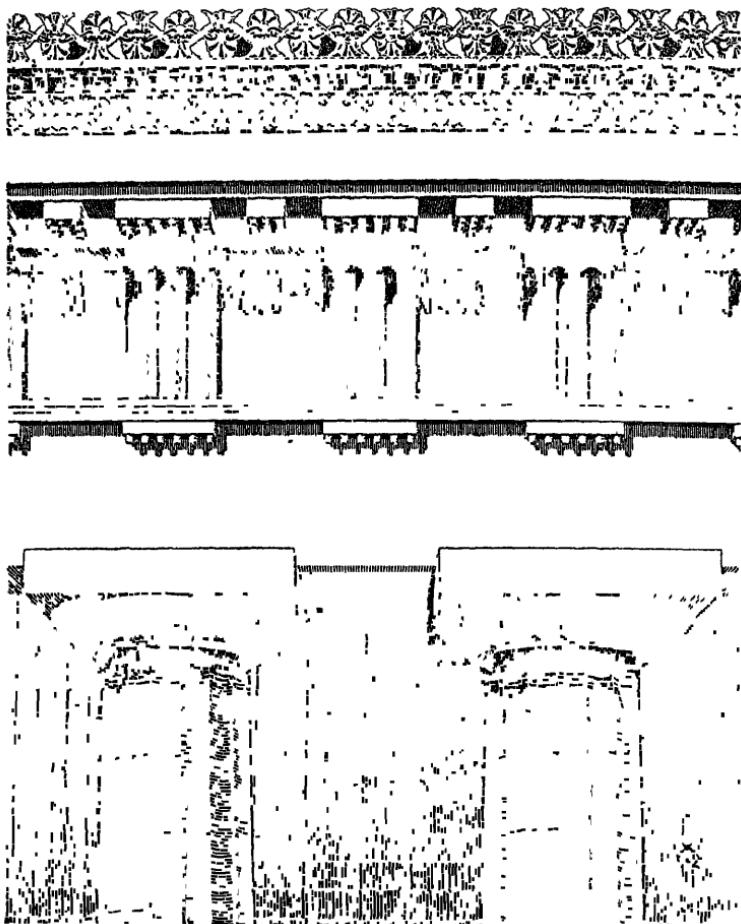


FIG. 23.—ENTABLATURE OF TEMPLE "C" AT SELINUS (Restored by Koldewey)

the same great length of the cella as compared with the width, and the same wide pteroma; but there are only thirteen columns on the flanks, the inner row on the façade being omitted and its place

PLATE XIX.



CAPITALS OF THE TEMPLE AT CORINTH.

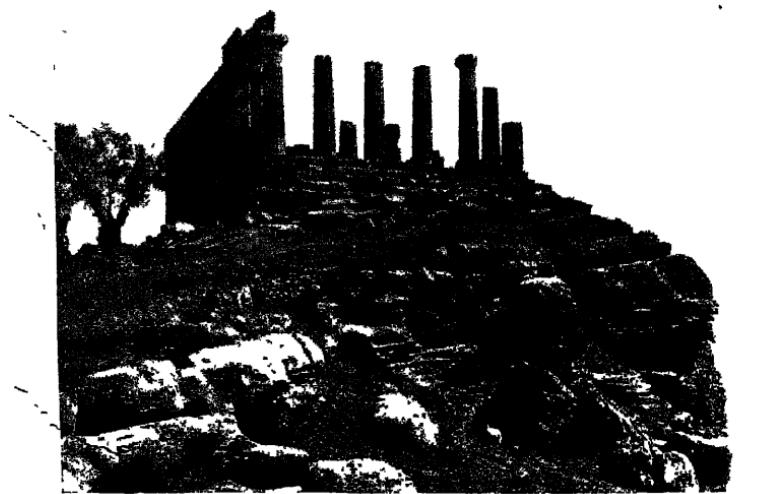


COLUMNS OF THE TEMPLE AT CORINTH.

PLATE XX.



THE TEMPLE OF APHAEA AT AEGINA.



THE TEMPLE OF JUNO LACINIA AT AGRIGENTUM.

taken by attached round columns instead of antae in the pronaos. Temple "FS," however, still retains the inner row of columns at the front, with the long narrow inner building and the absence of the opisthodomus which characterises "C" and "D." In temple "ER," with fifteen columns on the flanks, the opisthodomus appears. The largest temple, "GT," measured no less than about 164 feet by 362 feet. The columns are of three periods, on account

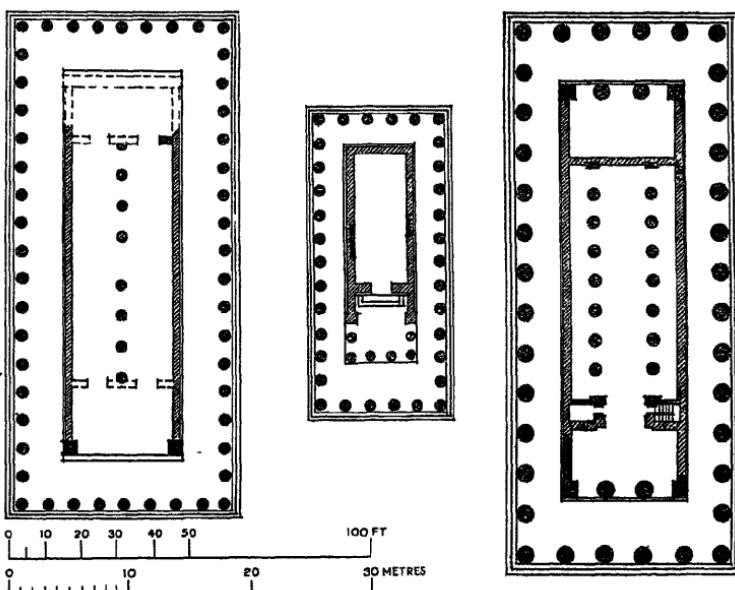


FIG. 24.—BASILICA, TEMPLE OF CERES, AND TEMPLE OF POSEIDON AT PAESTUM.

of the length of time required for the erection of the temple; the lower diameters were successively 9 feet 6 inches and 10 feet 10 inches, while the upper diameters successively increased from 6 feet  $3\frac{1}{2}$  inches to 7 feet and then to 7 feet 7 inches; so that the height of the columns, 5.61 diameters in the two earlier periods (from 530 B.C. to the end of the sixth century), was only 4.93 diameters in the later work of the fifth century. The pteroma is so deep that the flank walls align with the third column from each corner of the façade, making the temple in effect pseudo-dipteral.

The temple was never completed on account of the subjugation of the city by the Carthaginians in 409 B.C.

Of the three great temples at Paestum (Poseidonia), the earliest is the so-called Basilica (Fig. 24A, Plate XVIII); the discovery of the foundations of an immense altar at the east end has led to the conclusion that it was a temple. It had nine columns on the east and west fronts, with eighteen on the flanks, and a row of eight columns down the centre of the cella, but the neighbouring and similar temple of Demeter (Ceres) is of the ordinary hexastyle type (Fig. 24B). In both cases the capitals differ widely from any other known examples in the decorative treatment of the neck

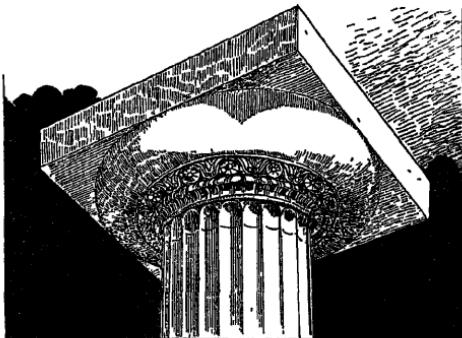


FIG. 25.—DORIC CAPITAL OF BASILICA, PAESTUM, WITH LOTUS AND ROSETTES. (Durm)

or gorge. In both there is a cavetto sinking in the neck, with a range of leaves projecting forward from it, a Mycenaean inheritance, the decoration in relief on the lower portion of the echinus of the Basilica (Fig. 25) is varied, there being three or four designs, two of which are Ionic in style, one of them recalling a similar design of the anthemion which decorated the soffit of the cornice and the door architrave of the Treasury of the Siphnians at Delphi (Plate XXIX). The cavetto sinking in the neck of the capital is found also in the temple of Apollo at Metapontum; and in all three examples there is a remarkable diminution in the upper diameter, and the curved entasis is more emphasised than that of any other temples. The prostyle inner columns of the temple of Demeter were completely Ionic, with bases. The capitals of the antae in the Basilica at Paestum are also of unusual form, the only parallel

being those found in temple "GT" at Selinus. The architraves of the three above-mentioned temples at Paestum and Metapontum were crowned by continuous mouldings, and in the temple of Demeter, where, as was usually the case with these archaic western temples, the intercolumniation of the two outer columns on each face was the same as that of the other columns, a wider metope was required to allow the triglyph to be placed at the angle (Fig. 26)\*. The most unusual feature in these temples is

\*It happens that all the four angles of the two fronts are gone, and Labrouste in his restoration placed a half-metope at the corner, and the last triglyph over the axis of the angle column. A metope, however, measuring

3 feet 8 inches instead of 2 feet 9 inches (the average dimension of the others) was later found, proving that the triglyph was in its proper place, viz., at the corner.

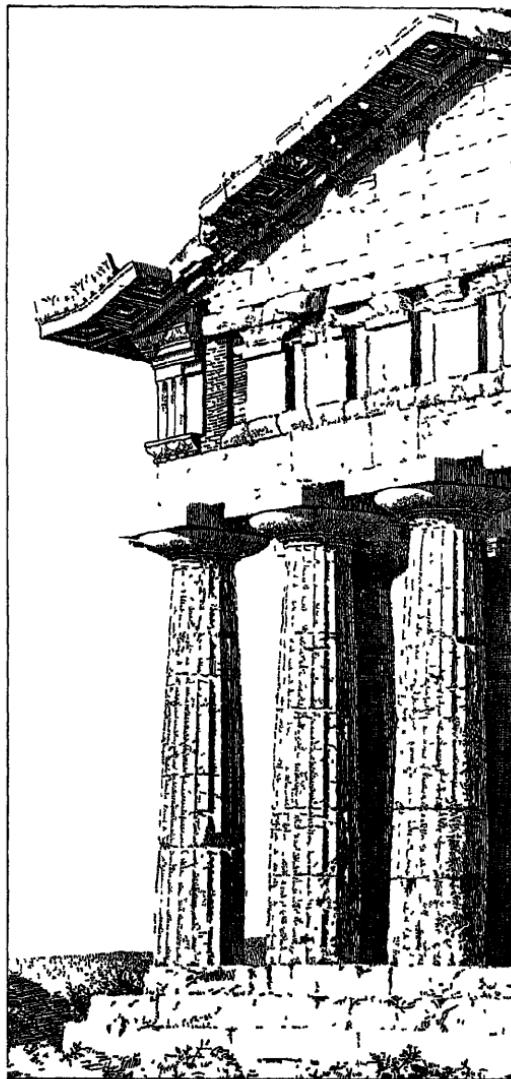


FIG. 26.—TEMPLE OF DEMETER AT PAESTUM  
PARTLY RESTORED (Koldewey)

the coffered cornice of the temple of Demeter, which bends at the corners to form the raking cornice on the facade, where the horizontal cornice is omitted. Another temple at Metapontum, more complete than the temple of Apollo and much more developed (though still belonging to the archaic period) is the so-called Tavole Paladine.

Another peculiar example showing Ionic influence, and this time erected in Ionian territory, was the temple at Assos in the

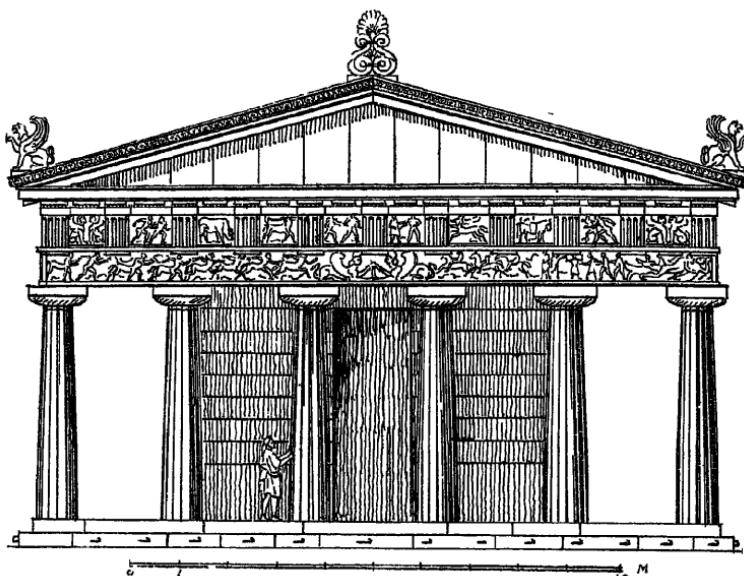


FIG 27—FRONT OF THE TEMPLE AT ASSOS  
(Restored by Bacon and Clarke)

Troad (Fig. 27), its date was probably about 540 B C.\* The temple is hexastyle peripteral, with columns 5.22 diameters high; the cella is of great length as compared with its width, and there is no opisthodomus. Its chief interest lies in the sculptured architrave, the only known example of so great a departure from precedent.†

\* A later date, in the fifth century, has sometimes been suggested, on the erroneous assumption that the distance from Athens would be enough to account for its archaic characteristics both in plan and decorative sculpture.

† For a later analogy in an Ionic building, the Nereid Tomb at Xanthus, see p. 151.

On the Greek mainland, the earliest peripteral temple of any importance after the primitive Heraeum at Olympia was the temple of Apollo at Corinth (Fig. 28, Plate XIX), erected soon after the middle of the sixth century \*. It was built from the first with columns and entablature of stone, and is one of the oldest of the developed archaic buildings now existing in European Hellas ; and this is only natural, for we have reason to believe that the city was an early centre of Dorian influence, and one which was in close touch with all the western colonies Of this temple but seven columns, 23 feet  $9\frac{1}{2}$  inches high, now remain, their shafts being monoliths, with lower diameters of 5 feet  $8\frac{1}{2}$  inches and 5 feet 5 inches ; the relations of diameter to height were respectively 4 16 and 4 41, the columns on the flanks being more slender, in accordance with the mainland custom ; the echinus of the capitals (Plate XIX) shows a tendency toward greater stiffness. The temple was originally hexastyle, with fifteen columns on the flanks, and presents the unusual feature of a double cella, one facing east, the other west, again giving very long proportions in the plan.

On the Acropolis at Athens was rebuilt, shortly after the erection of the temple at Corinth, the ancient temple of Athena, with a peristyle of stone (Fig. 51, E) ; it was destroyed by the Persians in 480 B.C., and its materials were utilised in rebuilding the northern wall of the Acropolis. Meanwhile, on the south side of the Acropolis, had been laid out the predecessor of the present Parthenon, with a hexastyle plan instead of the octastyle plan which now exists , in order to give great prominence to this Older Parthenon, a lofty platform was

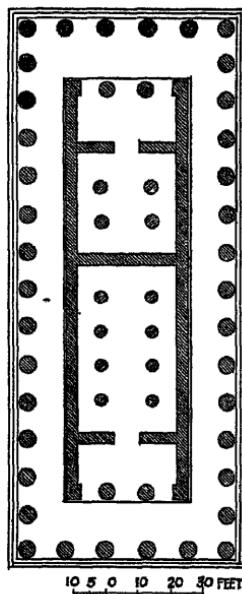


FIG. 28.—THE TEMPLE  
OF APOLLO AT CORINTH

\* There are of course numerous fragments of stone temples on the mainland dating from the first half of the sixth century, such as the Doric capital from Tiryne, with an abacus two and one-third times as wide as the upper diameter of the shaft.



FIG. 29.—OLD  
TEMPLE OF  
NEMESIS,  
RHAMNUS

erected just inside the old Pelasgian fortifications on the south side. This temple too, though barely begun, was likewise demolished by the Persians, and its materials were inserted in the northern Acropolis wall, while the platform was eventually utilised for the present Parthenon. Another frustrated attempt was the beginning of the great Olympieum by the sons of Pisistratus, abandoned when Hippias was driven into exile in 510 B.C.; the colossal platform measured about

$134\frac{1}{2}$  by  $353\frac{1}{4}$  feet on the stylobate. On the other

hand, numerous simple distyle in-antis temples were erected at this time in the neighbourhood of Athens, such as the older temple of Nemesis at Rhamnus (Fig. 29).

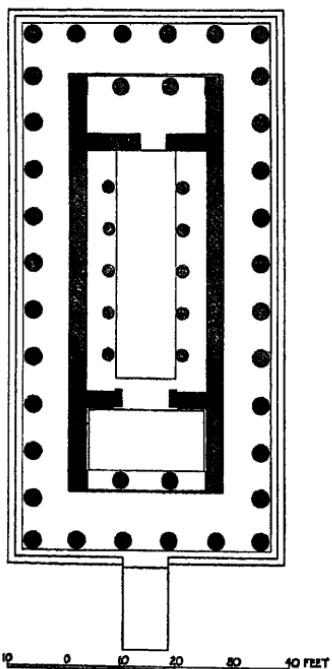
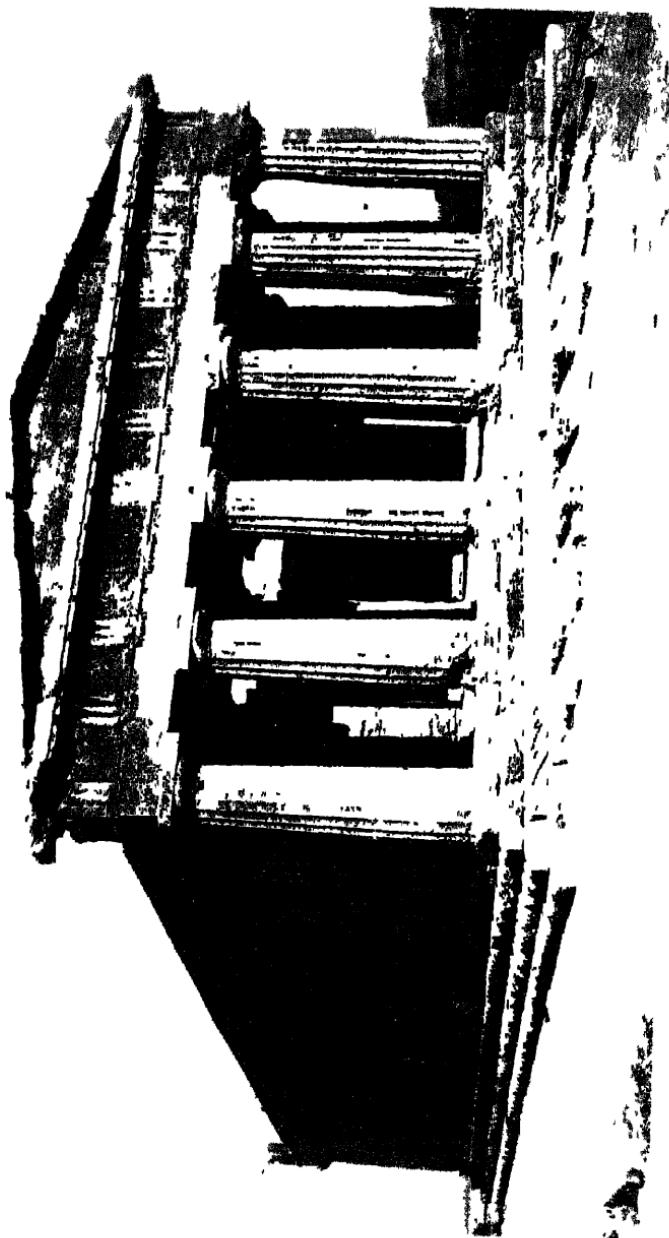


FIG. 30.—THE TEMPLE OF  
APHAEA AT AEGINA

The temple of Aphaea at Aegina is the most perfectly developed of these late archaic temples in European Hellas, though it really belongs to the transitional period, the beginning of the fifth century (Fig. 30, Plate XX), and the marble sculptures from the pediments, ascribed to about 480 B.C., discovered by Cockerell and Baron Haller and now in Munich, still adhere to the conventional expressions of the older style even though they show a great advance in the technical perfection of their execution. The temple itself, still fairly well preserved, was built in the limestone of the district, coated with a thin layer of stucco, and richly painted; the pediment sculptures, and the tiles on the pediments and eaves, were of Parian marble, the other tiles being of terra-cotta. The existence within the cella of superposed rows of columns on each side has led

PLATE XXI



THE TEMPLE OF CONCORD AT ACRAGAS



French archaeologists in particular to assume that the centre was open to the sky, forming a hyspaethron or opaion. But the primary object of such columns was to carry a flat ceiling and to assist in supporting the beams of the roof, for although there were undoubtedly some exceptional instances of hyspaethral temples, such as the case of the temple of Zeus Olympius at Athens mentioned by Vitruvius, they were probably extremely rare. The roof was evidently unbroken throughout its length, though some of the tiles may have been pierced to admit light to the roof space,\* and possibly thence, through framed openings in the coffered ceiling, to the cella itself †.

We come again to Sicily and southern Italy, to take up the later examples, which belong to the period of transition. The city of Acragas (Agrigentum or Girgenti) is one of the most remarkable examples of the way in which the Greeks availed themselves of the peculiarities of the site to give grandeur and emphasis to their temples. The ancient city was about ten miles in circumference, with two nearly parallel ranges of calcareous hills on the north and south. The higher ridge on the north became the acropolis, surrounded with walls and crowned with the principal temple, of which only six columns remain, embedded in the church of S Maria dei Greci, this acropolis is now the modern town of Girgenti. On the crest of the southern range, which lies parallel to the seaboard, and for the length of half a mile, are the remains of five or six temples. Below the two ranges, in the hollow and sheltered from the north and north-east winds, stood the ancient city, now completely lost. It is the magnificent treatment of the southern range which suggests one of the lessons that we may learn from Greek architecture. The Greeks did not think of cutting down the hills, or even of levelling the rock which their architectural work was to crown; they rather made the most of their natural character, and the best of the irregularities they presented (Plate XX). They wedded art to nature, and so united their work with the everlasting hills that it seems to be part of the same design. At the eastern, the highest, point of the range is the temple of Hera Lacinia, raised on a platform to give it greater

\* See below, with reference to Olympia and Bassae.

† Cockerell found at Aegina a block which had the appearance of being a coping-stone to an opening of some sort, and hence employed it for an opaion in the roof. But it has since been proved that this was part of an acroterion base at the apex of the pediment.

prominence. Then follow in succession the temples of Concord, Heracles (near the base of which is the sea-gate), Zeus Olympius, Castor and Pollux, and Hephaestus. The city walls facing the sea were hewn out of the solid rock, with tombs and sepulchral niches, and a broad terrace set out on the crest, with flights of steps to the several temples.

The most remarkable temple in size and design is that of Zeus Olympius, the largest in Sicily, its stylobate measuring about 173 feet by 361 feet, nearly three times the size of the neighbouring temples of Concord and Hera Lacinia. The temple had seven columns on the main fronts, fourteen on the flanks, and is technically described as heptastyle pseudo-peripteral, that is, a peripteral temple of which the columns are engaged to the walls of the cella (Fig. 31). For the order was on so gigantic a scale that the intercolumniations were filled with screen walls, to assist in supporting the entablature. The bases given to the columns, which are suggestive of Ionic influence, and the stylobate raised on a base with four steps below, are all innovations peculiar to this temple, which is just as remarkable for the unusual qualities of its design as for its size. Not all the features have been determined with certainty, and the exact position of the colossal telamones (*atlantes*), male figures used as architectural supports, 27 feet high, is still disputed. The fragments of one of these were collected and put together by Cockerell, who, in his restoration, assumed that they were raised on the square piers of the interior of the cella, and carried the timber roof; but Koldewey, with more probability, placed them on the external screen walls, to assist in carrying the entablature (Fig. 32).

Of the other temples at Acragas, the temple of Heracles is the most ancient, dating from the last years of the sixth century. This, as also those of Hera Lacinia (Plate XX), Concord, and Castor and Pollux, is of the ordinary hexastyle peripteral type. The best preserved is the temple of Concord (Plate XXI), which was at one time converted into a church by walling up the flank columns and piercing arches through the flank walls to form aisle arcades, this is so complete as still to show the cornice running round above the cella, with a sinking above to receive a flat ceiling, while in the cross walls of the pronaos and opisthodomus are openings to allow of a free passage through from one end to the other, the two stone staircases leading to the same still existing.

Besides the two very early examples at Syracuse, we must refer to one later temple, in the island of Ortygia—the temple of Athena, of about 485 B.C., which owes its partial preservation to the fact that it has been converted into the cathedral of the town. As was the case at Acragas, the cella now forms the nave of the church, and the cutting of large arched openings into the peristyle on either flank and the filling of the intercolumniations with walls have converted the flank colonnades into aisles. The temple was hexastyle (Fig. 33), and, measuring about 72 feet by 180 feet on the stylobate, it has become a church of fair size, though its beauty has been marred by repeated alterations and the total destruction of its main front.

Of the three temples at Paestum, likewise, one falls into the later period now under consideration. This is the largest of

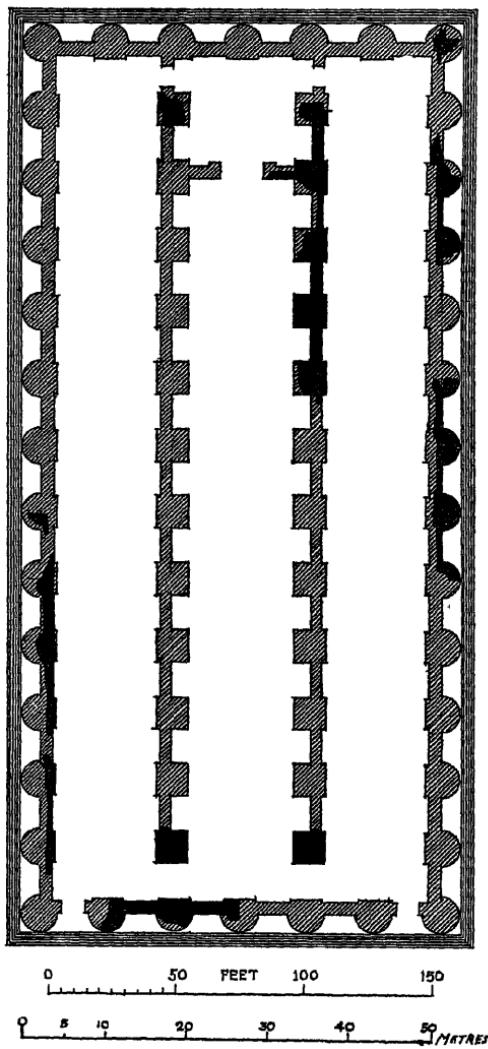


FIG. 31.  
THE TEMPLE OF ZEUS OLYMPIUS AT ACRAGAS

all those at Paestum, the temple of Poseidon (Neptune), which is one of the best preserved of all ancient temples (Fig. 24 C, Plate XXII). The relative proportion of the diameter to the height of the columns, 1 to 4.29, might seem at first glance to suggest an earlier date,\* but these heavy proportions

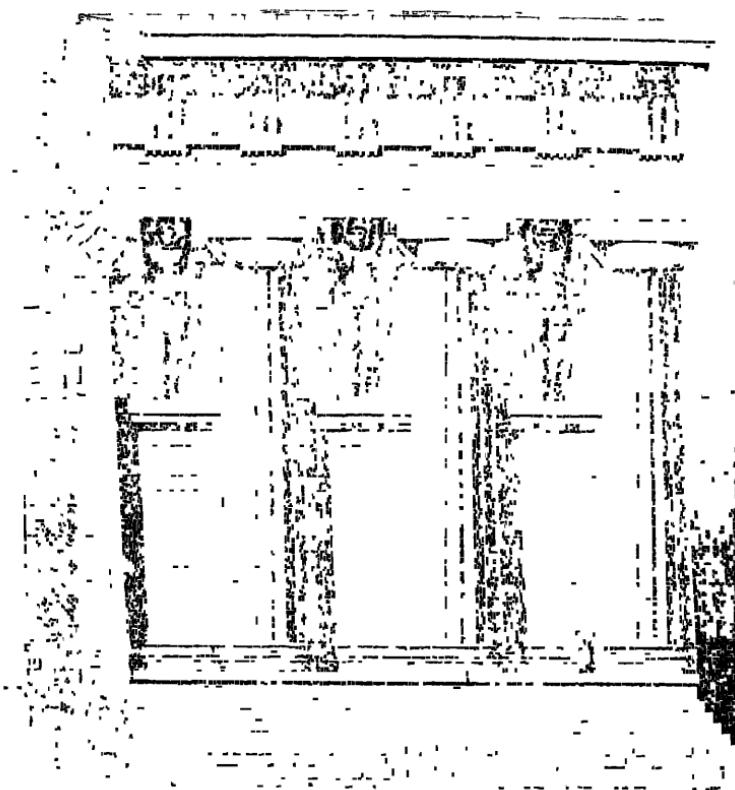
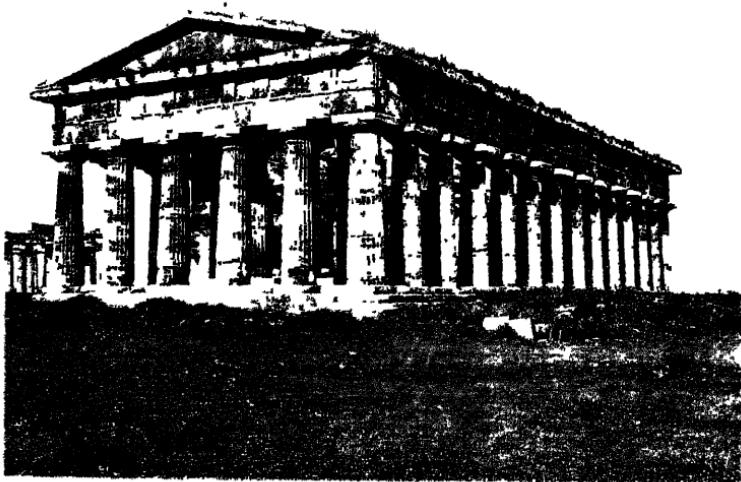


FIG. 32.—EXTERIOR ORDER OF THE OLYMPIEUM AT ACRAGAS  
(Restored by Koldewey)

are due only to the great size of the columns, the diameter being 6 feet 9 $\frac{1}{2}$  inches, and the other details of the temple are thoroughly developed. The cella still retains the double ranges of superposed columns (Plate XXII), the sole object of which

\* The earlier date was preferred in the previous edition of this work.

PLATE XXII



THE TEMPLE OF POSEIDON AT PAESTUM



THE TEMPLE AT POSEIDON AT PAESTUM (INTERIOR VIEW).



would appear to have been the support of the ceiling and roof, as there is no trace of any gallery, and the steps behind the pronaos led only to the roof.

The latest and at the same time the most impressive of these temples, owing to its isolated position in the hills and its perfect preservation, is the one at Segesta, in the north-west of Sicily (Plate XXIII). It has also other points of interest in that, never having been completed, the columns are in block form, the fluting not being worked, also the stones of the stylobate are only drafted, retaining their rough surfaces, and the ancones or bosses by which the blocks were hoisted still remain. The cella, furthermore, was apparently never built (Plate XXIII), and this fact not only shows the complete independence of the peristyle, but suggests that in these peripteral temples the first part executed was not the cella, but the peristyle. The temple dates from the last half of the fifth century, and the cause of its incompleteness was evidently the stagnation resulting from the subjugation of the island by the Carthaginians in 409 B.C.

Very different in plan from the ordinary Greek temple was the type erected at Eleusis in honour of Demeter; for this was rather a Hall of the Mysteries, a hall of initiation, than an ordinary temple intended to serve as the dwelling of a divinity. This type, therefore, was always square in plan, with its roof supported internally by a forest of columns, recalling an Egyptian hypostyle hall. The excavations undertaken by the Greek Archaeological Society in 1882 revealed the existence of two successive archaic halls on this site, the second

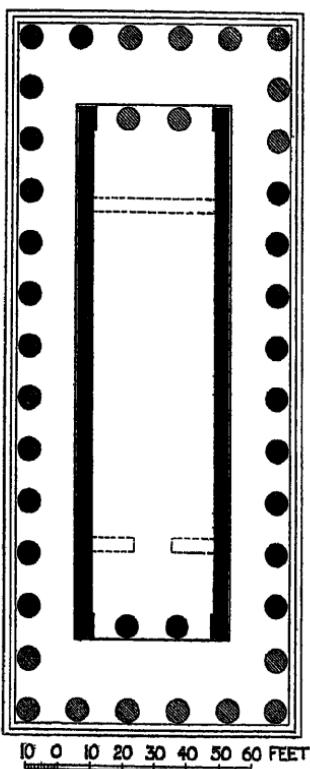


FIG. 33.—TEMPLE OF ATHENA  
AT SYRACUSE

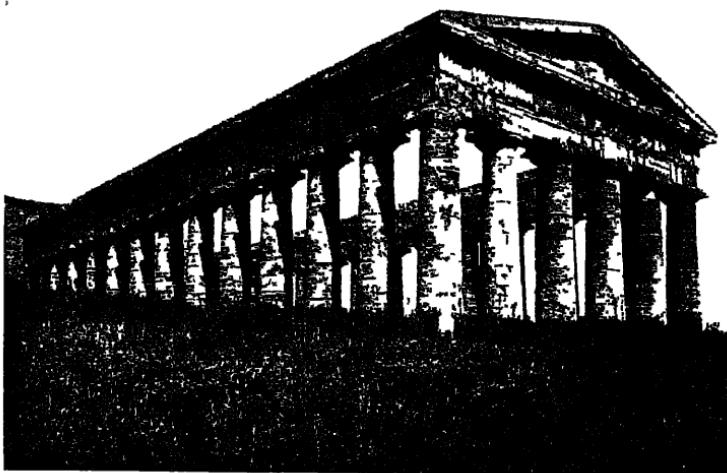
and larger of these (though only a quarter of the size of the great structure designed by Ictinus in the Periclean period) having been destroyed by Xerxes

\* \* \* \* \*

Up to the present our references to the temples have treated them as isolated buildings irrespective of their surrounding dependencies and enclosures, and as a rule the earliest modern travellers likewise confined their researches and descriptions to the particular temple they had sought for and discovered. But the most important temples of Greece were invariably surrounded by a wall forming a sacred enclosure or temenos (*hieron*), in which the principal shrine and other subsidiary buildings connected with it were erected. In some cases, as on the Acropolis at Athens, an entire rocky hill was girdled with walls and formed the sacred enclosure (Fig. 51, Plate XLV); in other cases, as at Olympia (Plate XXIV), where the site was a fertile valley, or as at Delphi, on the slope of a great hill (Plate XXV), an area of arbitrary shape was laid out and enclosed. These precincts contained not only the great temple of the presiding deity, and minor temples dedicated to other deities, but treasures erected by various cities to contain their offerings and the regalia of their processions; also, stoas or covered colonnades, on the walls of which were painted various episodes in the history of the country, mythological or otherwise, altars; and votive columns and statues, set up in memory of victors in the games, of heroes, or of munificent donors. In addition, the enclosures were often planted with trees and sacred groves, and provided with colonnades and exedras (semi-circular seats or shallow walled recesses) given by wealthy devotees.

The discovery of these accessories has been brought about owing to the great change made in the method of research during the last fifty years. The sites of the great shrines, in which the chief temples alone had hitherto formed the objects of investigation, are now in many cases completely excavated, and the superincumbent earth removed to a distance. By this system not only have new features been discovered in the plans of the temples themselves, which had escaped the attention of earlier explorers, but the foundations and the remains of numerous minor structures have been found, adding considerably to our knowledge. In fact, the discovery of the treasuries alone may be said to have

PLATE XXIII.

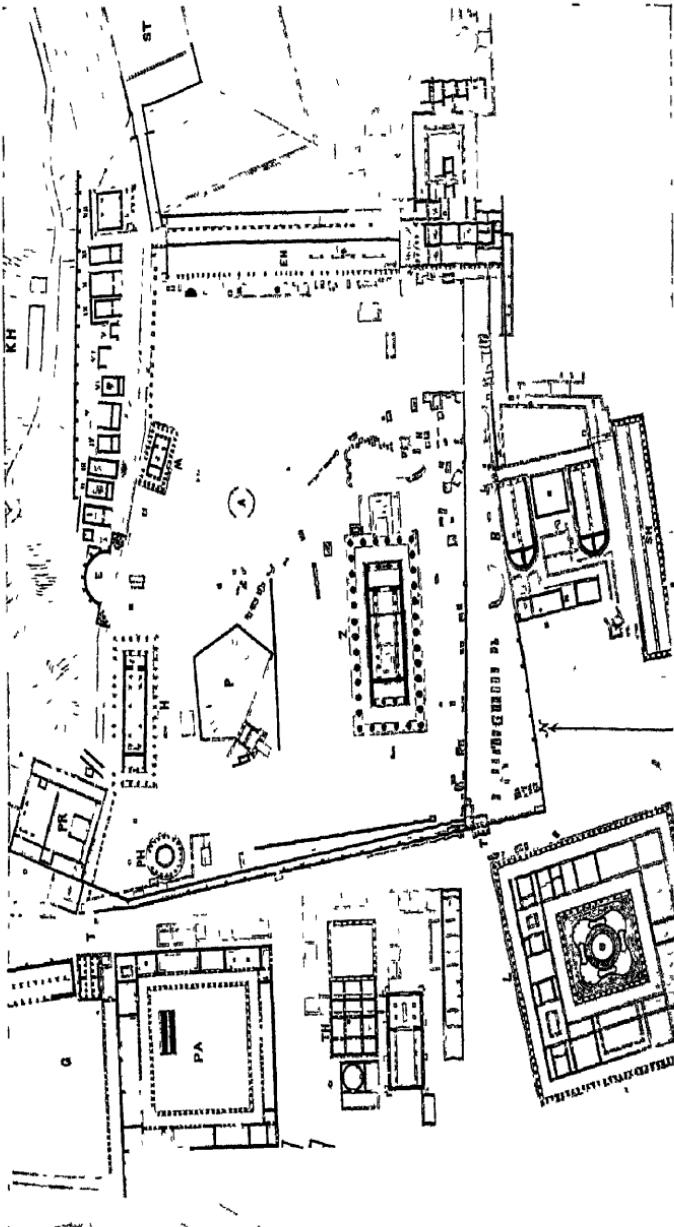


EXTERIOR OF TEMPLE AT SEGESTA.



INTERIOR OF TEMPLE AT SEGESTA.

PLATE XXIV.



PLAN OF THE PRECINCT OF ZEUS AT OLYMPIA.

added a new chapter to the history of architecture. The conjectural restorations of Olympia, Epidaurus, Delphi, Delos, and Eleusis, made by some of the "*Grand Prix*" students and based on the actual foundations and on the architectural remains, so far as the buildings are concerned, and supplemented by the addition of the groves of sacred trees with which the sanctuaries were planted, have suggested a magnificence, a combination of nature and art, which it is now difficult to realise to its fullest extent, and of which the only parallel is to be found in some of the

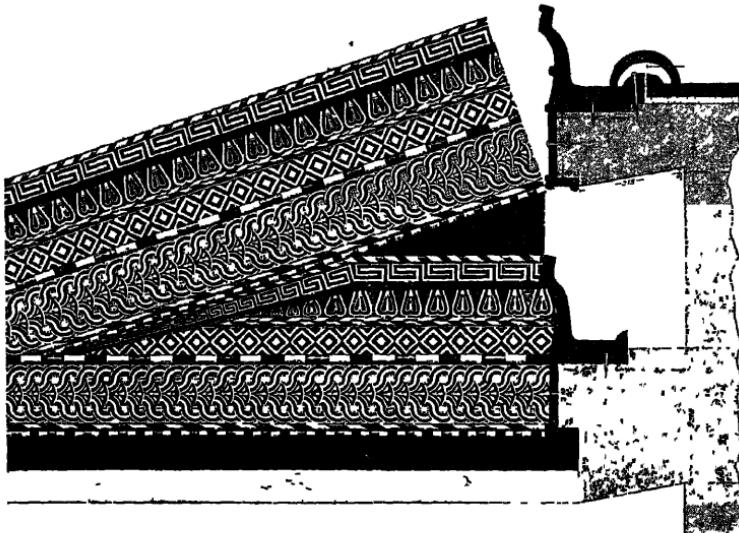


FIG. 34.—TERRACOTTA FACING OF CORNICES, TREASURY OF GELA AT OLYMPIA (Colours: Light yellow, red, and black.)

Buddhist sanctuaries in India, China, and Japan, where, in consequence of a somewhat similar cult, temples, tombs, and other monuments exist up to the present day.

The researches of explorers on all these sites have been greatly facilitated by the writings of Pausanias, who may be looked upon as the "Baedeker" or "Murray" of ancient Greece, and with whose description it has been possible to walk through the sacred precincts and to locate the principal monuments, giving them their true names and dates—a course which has been made easier by the discovery of numerous inscriptions on all the sites. In some cases, and particularly at Olympia, the inhabitants during

the Byzantine period had utilised the remains as materials for the building of fortification walls and other late structures, and in removing these walls a great number of valuable ancient fragments were recovered, many of which the excavators were able to assign with certitude to buildings in the precinct.

Akin to the temples, and situated within the sacred enclosure of the Altis of Olympia, were buildings known as Treasuries, which

were built by the various cities taking part in the Olympic games, for the reception of their offerings, arms, and other properties. Similar treasures existed at Delphi, Delos, and other sacred shrines to which pilgrimages were made. The plans of twelve of these treasuries have been laid bare at Olympia, on a terrace at the foot of Mount Cronus (Plate XXIV, I-XII). These buildings consist of a chamber about 16 to 20 feet square, preceded by a portico in-antis, and all of those at Olympia are of the Doric order. One of the treasures, that of Gela (Plate XXIV, XIII), is of more imposing size than usual, the chamber measures about 42 feet by 35 feet, and at a later date a hexastyle portico was added to it. Although but few remains of this structure were found on the spot, numerous blocks of the cornice and pediments discovered in the Byzantine walls round the site have been proved to belong to the building, and in these blocks of masonry were found nails which showed that they were protected or sheathed with terra-cotta slabs. And of the slabs themselves numerous bright-coloured examples were

FIG. 35  
PAINTED GRAVE  
STELE OF  
ANTIPHANES  
(Athens  
Museum)

found (Fig. 34), evidence of various kinds has shown that this treasury was built by Sicilian architects and that the terracottas themselves were imported from Gela in the south of Sicily. The protection of timber roofs by terra-cotta plaques was universal in Greece, but this is one of the few instances in which the tradition was extended to the sheathing of stone. The date of this treasury has been assumed by Dorpfeld to be the first half of the sixth century, the portico having been added a century later.



PLATE XXXV.



THE PRECINCT OF APOLLO AT DELPHI (RESTORED BY R. H. SMYTHE).

PLATE XXVI.



THE ATHENIAN TREASURY AT DELPHI.



CAPITAL FROM THE TREASURY OF MASSILIA,  
AT DELPHI (RESTORED CAST).

Much more developed, and typical of the Doric treasures of the end of the archaic period, is the marble treasury of the Athenians at Delphi, rebuilt at the cost of the city of Athens in 1903-1906 (Plate XXVI). In this we see the final form, distyle in-antis, the capitals showing the stiff echinus of the period just before 500 B.C., and the metopes of the entablature all carved in relief, while each pediment likewise contained sculpture filling the tympanum or recess enclosed within the triangular frame, besides the acroteria crowning the three angles.

Among the smaller monuments, votive, commemorative, and sepulchral, we may refer here merely to the typical archaic Attic grave stele or upright tombstone, crowned with a severe palmette springing from volutes, and the surface of the stele either carved in relief or painted, as on that of the monument of Antiphanes (Fig. 35).

## CHAPTER IV

### THE RISE OF THE IONIC STYLE

A SLIGHT sketch of the history of Asia Minor during the archaic period may help us in understanding the relationship of the kingdoms and colonies whose architectural expression, as distinct from that of the Greek mainland and the western colonies, forms our present subject. We have traced the story of the foundation of the Ionian colonies by the fleeing remnants of the Mycenaean populations, of their early contacts with the native peoples of Phrygia, Mysia, Lydia, and Lycia, and of the colonies which they in turn, as they increased in power, sent off to other parts of the Greek world. The result of this dispersion is that our knowledge of the Ionic style has to be gathered, not only from the great cities of Asia Minor, but also from trading colonies such as Naucratis in Egypt (probably dating from early in the seventh century, but subsequently enlarged by Aahmes II, 569-526 B C ), and from outposts established to receive surplus populations, such as Locri Epizephyru in southern Italy and Massilia (Marseilles) in France.

Like the Dorian cities, the wealthy Ionian cities became in this period the prey of "tyrants", merchant princes or captains of industry assumed dictatorial power, and to their love of display we owe some of the most important monuments of the time. Ephesus, "the first city of Asia," may be taken as the type. One of the earliest of the Ionian settlements, it came to be the leader of the confederacy, and was famous for its poets and philosophers, while it possessed great schools of architecture, sculpture, painting, and metal work. Another important centre was the island of Samos, which had a famous school of statuary, to which is accorded the invention of casting in metal. The influence of these cities upon the interior of Asia seems to have been of little account for some centuries: it was the narrow strip of shore that was magnetised by the greater mass of the interior, and the Achaeans parted with many of their characteristics under the new conditions. Lydia's

greatest period, about 560 B.C., is connected with the name of its king, Croesus, who tried to ally himself with the Ionian confederation, but neither party was ripe for such a conjunction of aims and resources. For want of this united front the district was conquered (in 546 B.C.) and Sardis captured by Persia, closing the history of the native kingdoms for two hundred years. Yet the fringe of Greek cities retained many of their privileges and still prospered. The proverbial jealousy, and consequent disunion, of the Greeks was the necessary weakness of their independent polity, and even in the Ionian revolt of the beginning of the fifth century, these Asiatic Greeks failed to meet the Persians as a compact and united force, while the rivalry of Miletus and Samos soon afterwards handed them a prey to Darius. It was left to their hardier European kinsmen to throw back the wave of Persian aggression at Marathon and Salamis. And it was as a direct result of the battle of Salamis that the Ionian cities were induced to form a part of the Empire League of Athens, and so, throughout the fifth century, temporarily lost their power of independent artistic expression and were subordinated to the leader of the hegemony.

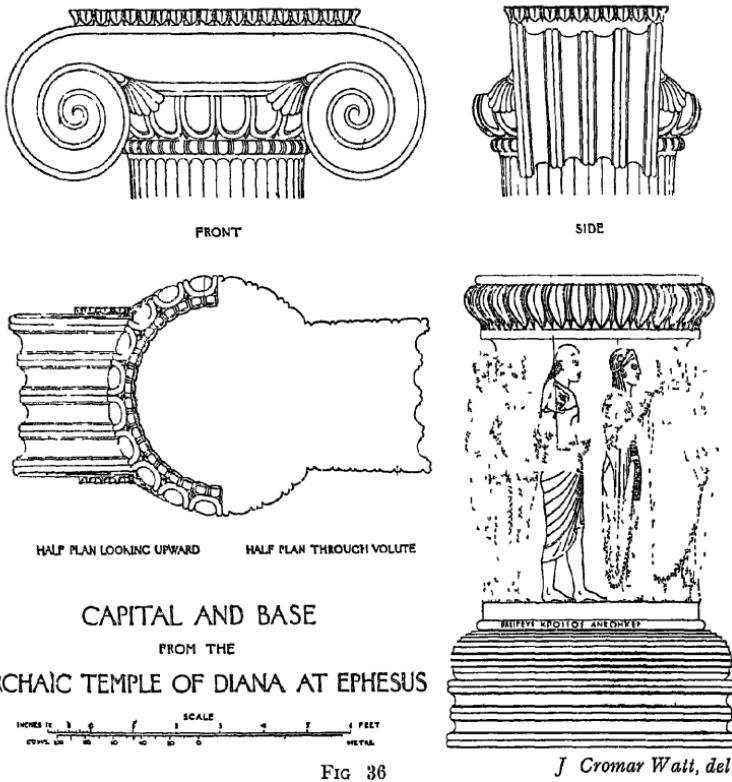
With some slight idea before us of the racial, historic, and social relationships of the Ionian Greeks, we may now turn to the more technical side of the development of the material fabric.

\* \* \* \* \*

The most typical of the archaic Ionic temples was the one dedicated to Artemis (Diana) at Ephesus, of which some traces were found by Wood under the temple of the fourth century later to be described, the whole being thoroughly re-examined by a British Museum expedition in 1905. This temple, known as the Croesus temple because some of the columns were erected at the expense of that Lydian monarch between 560 and 546 B.C., and in fact bear his name on the bases (Fig. 36), was found to have been built over the site of three earlier but much smaller examples. It was burnt in 356 B.C., according to tradition, on the night of Alexander's birth, and was rebuilt at a level 9 feet higher, but exactly on the same plan; and it is partly with the assistance of this later plan,\* combined with the traces of the Croesus structure, that the plan of the latter has to be reconstituted (Fig. 54). It was, therefore, dipteral (*i.e.*, with a double peristyle of columns all round), the Ionians showing a desire for magnificence which

\* See p. 141.

in Sicily was expressed by the double colonnade across the façade alone, hence, with double colonnades along the flanks, the west (main) façade was made octastyle, the rear façade enneastyle (with nine columns), and on each flank were twenty-one columns.



The Ionic bases have in this example assumed the characteristic Asiatic form, consisting of a large torus elevated on a horizontally fluted disk, the details of the profiles are extremely varied. Some of the torus mouldings are carved with pendant leaves, the heart and dart. Above these bases, in some of the columns, were sculptured lower drums, one of these has been put together with its archaic sculpture, in the British Museum (Fig. 36), and it shows that the later Ephesian temple derived from the earlier or archaic one the idea of sculptured drums for its columns. This is a

peculiarity confined to Ephesus, as far as is known. The shafts otherwise contain forty, forty-four, or even forty-eight very shallow flutes, spaced so closely that, as in other early examples of the Ionic column, there were no fillets between the flutes, but merely sharp edges or arrises as in the Doric order. The total height of these early columns at Ephesus, according to Vitruvius and Pliny, was eight diameters, though the diameters vary so considerably, together with the variant spacings on the different sides of the temple, that it is difficult to select the one which should be used as the basis of calculation. In any case, it is obvious that the Ionic shaft had from the very beginning a proportion widely different from that of its step-sister the Doric. Its work was less, the whole design of the Ionic temple was lighter and more delicate, particularly the entablature which it had to carry, and it may be accepted as a principle of these early architects that the strength of the columns was determined by what they had to carry. In this way it came about that the Ionic column assumed a proportion of eight or nine diameters in height, while the Doric amounted to four or five only, in proportion to the weight of their respective entablatures there was, however, no great disparity of strength or efficiency.

When we come to what has always been regarded as the index mark of the style, the capital, it is apparent that by the time the temple at Ephesus was constructed a marked change had transformed the order. The volutes, instead of springing vertically from the shaft as in the Proto-Ionic examples, now lie horizontally, and are connected by the cushion, and below them the girdle of hanging leaves has become the egg and tongue, the echinus. The illustration of the capital from Ephesus now restored in the British Museum (Plate XXVII) shows the undeveloped nature of the spiral band of the volute (convex rather than concave as later, with a single separating astragal, and no central eye), of the palmette ornament which fills the triangular gap between the cushion and the echinus, and of the carved egg and tongue itself. Only the bead below the echinus is carved on the topmost drum of the shaft, the echinus and the volute cushion being carved together in the same block, on the bolster side the echinus is partially sunk in the cushion of the volute, only the lower portion remaining visible. The echinus still shows the traces of its origin in the convex girdle of overhanging leaves, in that the upper portion recedes and is cut off horizontally.

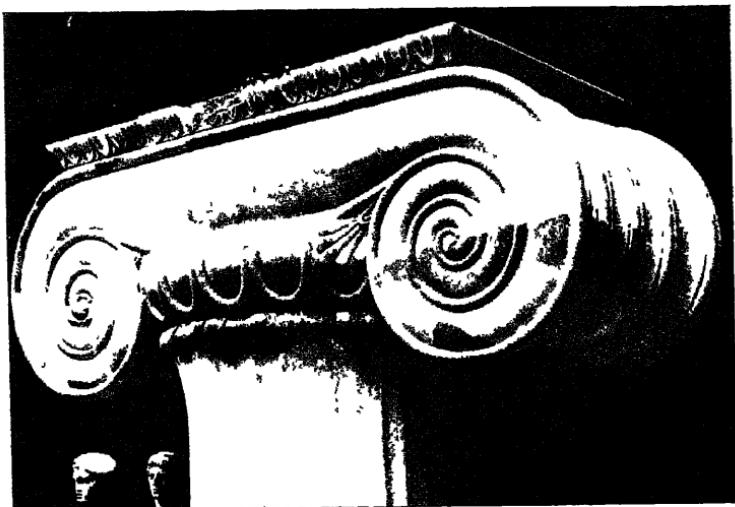
at the top. But the most remarkable feature is the great length and narrowness of the thin slab forming the abacus at Ephesus, an oblong almost twice its length, instead of the nearly square form to which the later examples have accustomed us, and profiled as a cyma reversa, carved with the leaf and dart. The effect is that of a bracket-capital intended to lessen the bearing of the architrave between the columns, and the side elevation of the capital has little of the cushion or bolster shape which it afterwards assumed. Some of the capitals on the main façade were particularly ornate, with rosettes covering the volutes (Fig. 27).

The chief defect of the Ionic order lies in the angle capital, which, owing to the necessity for making the volutes face in two directions, loses its structural significance and individual beauty. The capital seems to have been designed rather for interiors and for porticoes *in-antis*. But its use in a peristyle or a peripheral building, such as the temple at Ephesus, immediately led to difficulties. With a single round column at the angle, no other solution was possible than to bend angle-wise in plan the volutes which meet at the external corner; in other words, to unite and turn aside the useless parts of the bracket (*cf.* Fig. 47). On account of the tremendous length and comparative narrowness of the capitals at Ephesus, it would seem that at the inner corners, where the two volute faces intersect each other, the complete curve of each volute must have been preserved,\* instead of being cut in halves as in later examples.

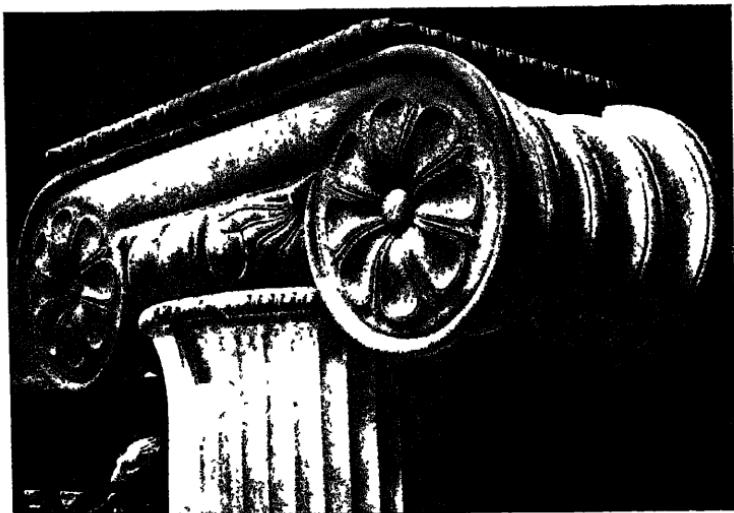
Of the entablature at Ephesus only the slightest traces are preserved. There is nothing of the architrave, probably triply divided and stepped, which was so colossal that the mechanical difficulties of its transportation and erection (the central span on the west being 28 feet 8 inches) caused great distress to its designers, Chersiphron and Metagenes. We have only a few fragments of the cornice, and of the colossal marble sima or gutter in the form of a parapet, 2 feet 10 inches in height, which edged the roof, inclined slightly forward and carved with figures in low relief, so that it formed a zoophorus, with outlets for rain-water at intervals in the form of lion heads. Up to this level the entire structure, in contrast to the Doric temples of the west, was constructed in marble. But the great tiles with which the roof was covered, and

\* This is shown in Henderson's restoration in the British Museum publication.

PLATE XXVII.



CAPITAL FROM THE ARCHAIC TEMPLE AT EPHESUS  
(BRITISH MUSEUM).

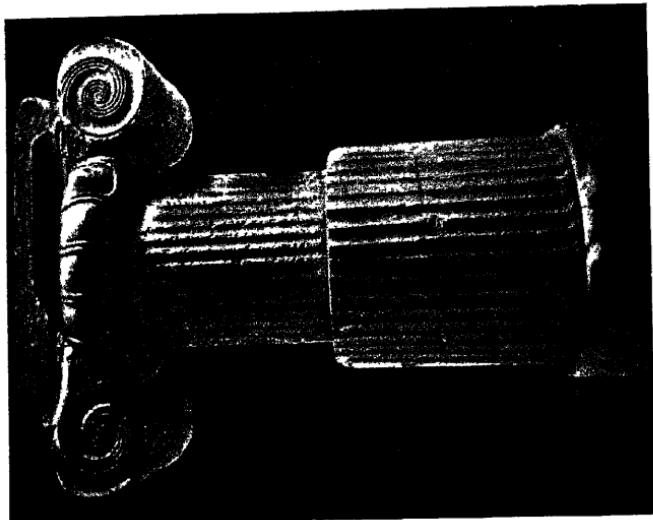


CAPITAL FROM THE ARCHAIC TEMPLE AT EPHESUS,  
(BRITISH MUSEUM).

PLATE XXVIII.



CORNICE AND SIMA DECORATION FROM THE  
TEMPLE OF APHAIÀ AT AEGINA.



NAXIAN VOTIVE COLUMN AT DELPHI.

of which many fragments were found in 1905 in the pockets of the foundations of the later temple, were of terra-cotta for the sake of lightness of construction,\* since they were carried upon wooden beams and rafters.

Other examples of the archaic Ionic style are far more fragmentary. At Miletus, or rather at Didyma (Branchidae) near by, there was an early temple on the site of the great structure later to be described, but this temple was burnt by Darius, and after a partial restoration was completely destroyed by Xerxes, so that its only relics are the archaic seated figures, some of which are in the British Museum, that originally bordered the sacred way leading up to it. And at Naucratis in Egypt, a daughter city

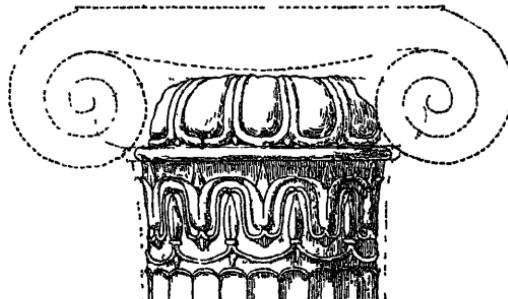


FIG. 37—CAPITAL FROM THE TEMPLE OF APOLLO AT NAUCRATIS

of Miletus, was found by Prof. Flinders Petrie one of the earliest known examples of the archaic Ionic capital, the date probably goes back to about 569 B.C., when Aahmes (Amasis) II allied himself with the Greeks and gave them special religious and commercial privileges. In this case the volute cushion was carved separately, and is now missing, though a fragment of it was seen by the excavators; a restoration is suggested in Fig. 37. The echinus, carved on the topmost drum of the shaft, is even more primitive than that at Ephesus, the egg and tongue clearly showing its origin in the overhanging leaves of some plant, the eggs are carved even on the upper surface of the echinus and die into the horizontal bed which carried the volute cushion. It would seem that this egg and tongue, which is in effect the crowning feature

\* It was at this period, however, that "tiles of stone were first made by Byzes, a Naxian" (Pausanias, V, 10, 3), and such Naxian marble tiles are known.

of the shaft, must have been largely visible even under the bolster side of the volute cushion. Below the echinus a smooth astragal, or in some cases a beaded astragal, was carried round the top of the shaft. The capital found at Naucratis is interesting also in other ways, the upper part of the shaft is slightly bell-shaped, increasing in diameter as it rises, and is decorated with a necking of the lotus flower and bud, which may have been the prototype of the well-known anthemion or honeysuckle, such as was used on the columns of the Erechtheum. The shaft has the numerous shallow flutes with sharp arrises between, terminating below the necking with slightly projecting lips like overhanging leaves or petals, a treatment similar to that recurring in a much later example—viz., in the capital of the monument of Lysicrates.

Slightly more developed was the colossal temple at Samos, of which the remains have recently been excavated, showing that it was dipteral as at Ephesus, with eight columns on the main façade and nine columns on the rear, and twenty-four on either flank. Here again the volute cushion and the echinus moulding are carved out of different blocks, the latter being in fact the crowning moulding of the shaft, and carved out of the upper drum of the same. The volutes show the same treatment with the convex “canal” and the simple separating astragal that we observed at Ephesus. In a few instances, probably on the façade, a carved necking appeared below the capitals, as at Naucratis. But the shafts reveal a new development in the columns which are finished, the flutes have become deeper, and so, with the deeper cutting, they could not so well retain the sharp arrises of the earlier examples, with the result that a narrow fillet of the rounded surface of the column was preserved between the flutes, concave and very slightly convex surfaces contrasting over the whole of the shaft. Likewise on account of the deeper cutting and the space required for the fillets, the number of flutes was reduced to the normal figure, twenty-four. Similar characteristics, with the carved necking and the twenty-four deep flutes with fillets between, occur in another peripteral Ionic temple as far afield as Locri Epizephyru in southern Italy (Fig. 38), an instance of the Ionic invasion of the west, counterbalancing the Doric temple at Assos in Asia Minor.



In the form of smaller monuments, as distinct from temples, the Ionic style freely penetrated into districts which in religious architecture were more strictly devoted to the Doric style. This was particularly true at Athens, where Pisistratus and his sons were closely affiliated with the Ionic tyrants, and at Delphi, where the Ionic states in common with others dedicated offerings. Some of the archaic votive capitals discovered at Athens, and now in the Museum of the Acropolis, and others at Delos, still

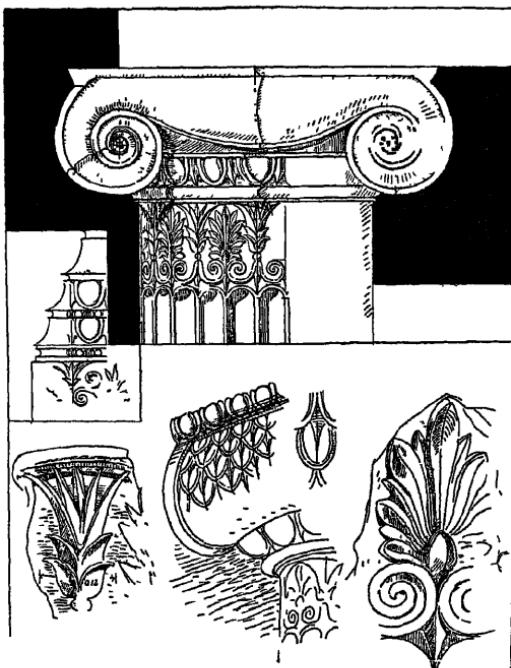


FIG. 38.—DETAILS OF CAPITALS FROM LOCRI (Durm)

retain reminiscences of the Proto-Ionic type, with vertical volutes, or even horizontal volutes as yet not connected, and in technique some are merely masses or blocks with the spirals traced or painted on, in what must have been the primitive manner (Fig. 39). Two of them have the egg and tongue deeply undercut, with a cavetto which recalls the original form of the pendant leaves; it is in such examples as these that we find the first transition from the

overhanging leaves. A similar form, with the cavetto instead of the bead which usually runs under the echinus moulding, occurs in the capital of the Naxian votive column at Delphi (Plate XXVIII) ; and here the shaft still shows the forty-four shallow flutes with sharp arrises between, in the earlier manner, though the "canal" of the volute is now concave rather than convex.

Even in buildings we find instances of this penetration of the

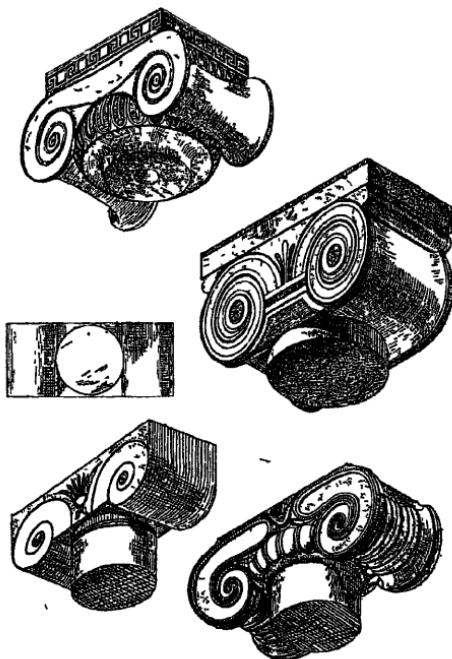


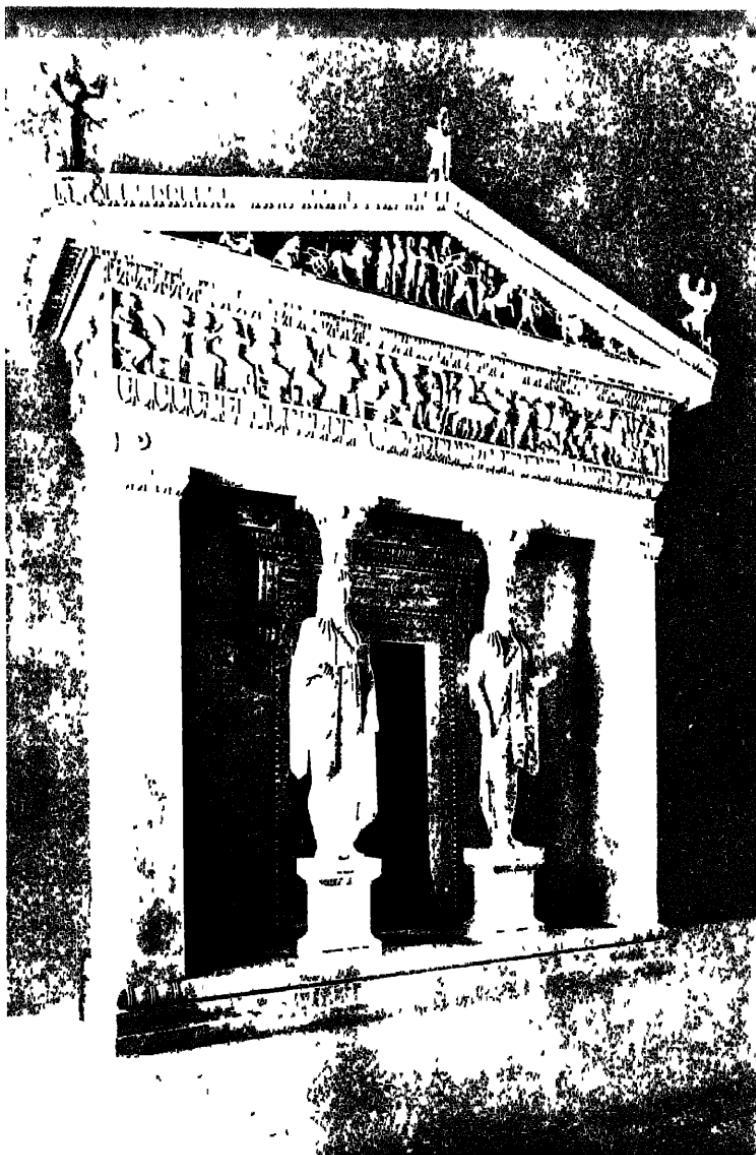
FIG. 39.—VOTIVE CAPITALS FROM ATHENS AND  
DELOS. (Restored by Chipiez)

maidens, as the Greeks first called them) raised on pedestals, and carrying a polos with a projecting capital of singular design, took the place of columns, forming prototypes of the much more developed Caryatids of the Erechtheum. The whole was built of Parian marble, and brilliantly coloured ; vivid traces of colour existed in the fragments found, and the elaboration and carving of the mouldings are equal to those of the Erechtheum at Athens, which it precedes by

\* Formerly misnamed Treasury of the Cnidians

Ionic style, as in the archaic Colonnade of the Athenians at Delphi, built against the raised terrace of the temple of Apollo. But the most famous instance is one of several marble Ionic treasures discovered by the French at Delphi, the Treasury of the Siphnians,\* erected at about 525 B.C. ; although of small dimensions, only 20 by 28 feet on the stylobate, it is one of the most richly decorated of such buildings that ever existed (Plate XXIX). The vestibule consisted of a portico in - antis, in which Caryatid figures (or

PLATE XXIX



RECONSTRUCTION OF THE SIPHNIAN TREASURY (DELPHI MUSEUM)



fully a century The enrichment of the mouldings of the entablature and pediments, and the anthemion designs round the architrave of the doorway, on the soffit of the cornice and on the sima (Plate XXVIII) are thoroughly Ionic in style. The frieze, or zoothorus, 2 feet 1 inch in height, was enriched with sculpture in high relief, painted in red, blue and green, the effect being heightened by bronze spears, wheels of chariots, and bronze harness fastened to the marble In the pediments were groups of figures of less size, the upper portions of which were carved in the round and detached from the tympanum at the back A second of these Delphian treasures, that of the Cnidians, likewise had Caryatid figures but was much less ornately decorated And two other marble Ionic (or Aeolic) treasures of this epoch had columns with Ionic bases and shafts, but with peculiar basket capitals of which one example (Plate XXVI), from the Treasury of the Massiliotes, had been sketched at Delphi by so early a traveller as Cockerell

\* \* \* \* \*

Such was the artistic expression of that phase of culture known as Archaic Ionic, of which the details from the early temple of Artemis at Ephesus give the best idea It was at this early period that the structural development of the style was completed , the genius of subsequent architects through centuries was altogether directed to a refining and modifying process, to a close study of every possible elegance and polish consistent with quiet and sound taste, to the obliteration of every crude line, harsh angle, or unseemly form In such ways they reached the perfection of the temple of Athena Nike and the Propylaea, which were not so much the works of their particular architects as the matured fruit of a succession of harvests the result, as we see now, of the dispersion to Asia, of the atmosphere which the Asiatic colonist breathed, and of the archaic temples to the mother-goddess of the Phrygian people, whether in the guise of Artemis or of Cybele Yet who would affirm that the Greeks were automatons working out unconsciously a line of development, following blindly a predestined course? If ever architects thought or planned or designed with true originality, they were the Greeks But it was the conservatism, the traditionalism, of the style which, after its constructive form was fixed, gave us the masterpieces of the culmination in Athens.

## CHAPTER V

### THE CULMINATION IN ATTICA AND THE PELOPONNESUS

As we have already pointed out in a preceding chapter, during the period described as Archaic the structural development of the styles was completed, no great constructive improvements showing themselves after about 500 b c The next two centuries would seem to have been directed chiefly to the beautifying and refining of the constructive features already prescribed and it was in fact a conservative adherence to the older type, and a traditional respect for previous result, which led them ultimately to the production of such masterpieces as the Parthenon, the Propylaea, and the Erechtheum, the perfection of which would have been impossible but for the careful and logical progression of the preceding centuries

It has been said that behind and beyond any cause that we can specify for a development in art and in civilisation itself there is an economic one, and this theory may be applied to the culmination of Greek art That a great period in art production should arise, there must be a certain over-production and accumulation of wealth, which may be said to find an outlet in the various channels which architecture and art supply According to this view of it, we may trace the Egyptian monuments back to the wealth of the Pharaohs, the architecture of Rome to the spol of the world, and in like manner find an explanation in an economic sense of the central period of Greek art, the age of Pericles The wars with Persia had enriched Greece, and the naval supremacy of Athens, displayed most of all in the battle of Salamis, had raised her to a position of the greatest influence among the Greek cities so that when the Persians were driven out of Greece, many of the islands and the coast cities of Thrace and Asia Minor effected an alliance, with Athens at their head, permanently to keep the Persians out of all Greek lands. Athens, gradually assuming greater authority, practically came to treat them as subject cities, even exacting

tribute , and thus riches, talent, and power passed from them into the capital of the hegemony. It was about this time that she, under the leadership of Pericles, took the greatest and proudest place among great cities, built her most beautiful temples, and brought forth her greatest artists , and it is the artistic work of this period, which in its beauty reaches its culminating point of perfection together with all else that was greatest in its history, that we have now to study

Yet the wonders of the Periclean age would have been impossible but for the long line of Greek artistic tradition, which had been preparing the way not only in Greece but also in Asia Minor The reflex action of these Ionian cities upon Greece proper can hardly be overestimated, in considering all the causes of the culmination For, as has been already observed, Athens was an Ionian city from early days, and was influenced largely by, and had much commerce with, her compatriots in Asia Minor But besides this domestic influence, there was at work one of almost equal power, namely, the development of Doric principles and manners in the Peloponnesus, by which Athens, if for no other reason than her situation, must have been moulded Leader of the Ionians in the Grecian motherland, she could not escape the influence of her Dorian neighbours Hence it came to be, by an irony of fate, that her greatest temple, the Parthenon, and her most popular monument, the Propylaea, were in the Dorian style, though they were in many respects different from the Dorian works elsewhere Or was it that she strove to show that even the Doric style itself could only attain perfection on Attic soil ? In every place except Attica, the cleavage of the styles with the population is quite marked The Doric so prevails in Sicily, southern Italy, and the Peloponnesus, where the Dorians predominated, that only one or two purely Ionic temples have there been discovered , on the other hand, the temples of Athena at Assos and Pergamum are the only important Greek Doric works in Ionian territory outside of Athens

Another decisive factor was the appearance of a group of great artists to whom this economic over-production and developed artistic tradition afforded opportunity for the exercise of their skill We know at least the names of the great architects and sculptors of this period, and we can identify some of their works. Leader among the architects was Ictinus, the designer of the

Parthenon, which he made the subject of a book, unfortunately lost, but mentioned by Vitruvius, this architect also designed the temple of Apollo at Bassae, near Phigalia, a work which, though it does not exhibit all the grace of the Parthenon, is of refined and remarkably advanced character. Ictinus was assisted in his work on the Parthenon by Callicrates, of whom less is known, and the name of Mnesicles has come down to us as that of the creator of the Propylaea, which, as will afterwards appear, he did not leave complete or even as he had originally intended it to be. All these works, the Propylaea, the temple at Bassae, and in a lesser degree the Parthenon, embrace both Doric and Ionic principles, as well as their distinctive features, and Callicrates, furthermore, is known as the designer of purely Ionic works, such as the temple of Athena Nike, while it is quite possible that Mnesicles was the author of the Erechtheum. Beside these, Phidias, king of sculptors, must have an honoured place. This Athenian, at the time of the erection of the Parthenon, already enjoyed great fame throughout Greece, and consequently he was able to command talent of the highest order in carrying out his work—for it is not to be supposed that he executed with his own hands the pediment, frieze, and metope sculptures of the Parthenon, though they were doubtless all of his conception. Among the greatest works of Phidias were his cult statues and votive monuments; to the latter class belongs the colossal bronze statue of Athena Promachos, made of Persian spoil, which stood on the Acropolis between the Propylaea and the Erechtheum (as shown in the restoration, Plate XLV, cf. Fig. 51, D), and whose gilded helmet crest gleamed 53 feet above the rock, a landmark for sailors far at sea, and in the former class was the world's wonder of the Panhellenic Zeus at Olympia. To these, under the patronage of Pericles, he added the gold-and-ivory figure of Athena in the cella of the Parthenon, and the bronze statue of the Lemnian Athena which stood near the Propylaea. In lesser undertakings we meet the names of other sculptors, chiefly the pupils of Phidias, such as Agoracritus who worked at Rhamnus, and Alcamenes who worked in the Theseum, and there was also Callimachus, the designer of the Corinthian capital. These are merely the names of the men in the immediate employ of the Periclean government; but also in other parts of Greece we meet at this time a few prominent names, such as Libon of Elis and Eupolemus of Argos, the architects, and

Polyclitus of Argos and Paeonius of Mende, the sculptors.

Before devoting our attention to the works which owed their inspiration to Pericles and his advisers at Athens, it is desirable to examine one or two of the Peloponnesian temples which form a prelude to the culmination. The most important of these was the main temple in the precinct already described at Olympia, erected from the designs of Libon of Elis and dedicated to Zeus. In plan it is of the normal hexastyle Doric type (Plate XXIV, Fig. 40), with thirteen columns on the flanks; in size, however, it was most imposing, the largest of the Doric temples erected in Greece proper. It was built in the coarse shelly limestone of the district, covered with a thin coat of white stucco and painted; but the pediment sculptures, the metopes of the inner porches, and the simas and roof tiles, were of Parian marble (partly repaired in later times with Pentelic marble)\* and the acroteria were of bronze (Plate XXX). Portions of the remains of the temple were already known as a result of the partial exploration of the site by the French *Expédition de Morée*, but the complete exposure of the plan by the Germans has revealed features hitherto unrecorded. Obviously the building had never been converted into a church, as in the case of the Parthenon and other temples in Greece, and therefore the pavement is better preserved and shows traces of the folding gates between the columns and antae of the pronaos, as also those of the great door leading into the cella. A range of seven Doric columns on each side, of limestone like those on the exterior, divided the cella into a nave and two side aisles, and carried a gallery (a later insertion), with an upper range of columns to support the ceiling (Plate XXX). Just within the great doorway, on either side, have been found the

\* Pausanias speaks particularly of the roof of marble "wrought into the shape of tiles." It has been suggested (*cf.* Penrose in Whibley, *Companion to Greek Studies*, 3rd ed., 1916, p. 278, and P. Gardner, *Principles of Greek Art*, 1924, p. 47) that Parian marble was employed for the tiles, here and elsewhere, on account of its translucency, which would not only light the space between the roof and the ceilings of the peristyle and cella, but might even partly account for the illumination of the interior of the cella, through openings in the framed ceiling, which otherwise was lighted alone through the open door. But the existence of special tiles with elliptical openings shows that the architect was not disposed to rely solely on the translucency of the material. A number of tiles with similar pierced openings surrounded with projecting rims have been found at Pompeii, and drawings of some are given by Durm, *Baukunst der Römer* (1905), p. 333, Ill. 363, see also below concerning Bassae. In any case, we must reject the idea, so frequently advanced, of a hyspaethral opening in the roof, which with its notch in the ridge line would have had a very ugly effect from the exterior,

sinkings in which it is supposed that the string-pieces of wooden stairways were fixed, leading, as Pausanias says, to the gallery on either side of the cella, and continued up to the space between the ceiling and the roof. Across the cella are the traces of a stone screen about 5 feet high, with folding doors in the centre, and similar stone screens, from the second to the fifth columns on each side, were fitted within the central flutes of the columns. Beyond the fifth columns, round the spot where the pedestal of the statue stood, are traces of metal enclosures, and metal gates also closed each aisle between the second columns and the walls on either side. Access, therefore, to the inner portions of the cella, and by staircases to the galleries, was given only to privileged persons, so that they could approach nearer to the chryselephantine statue of Zeus. In front of the base of the pedestal was a sunk pavement of bluish-black Eleusinian limestone, enclosed by a raised border of Pentelic marble, forming an impluvium or shallow tank in which the oil, mentioned by Pausanias, was kept, the oil apparently being necessary to prevent the ivory from splitting, and probably the wooden core from swelling, in the damp climate of the Altis.\*

Slightly later in date is the temple of Apollo Epicurius at Bassae in Arcadia, a remarkable example by Ictinus, the architect of the Parthenon, and suggestive of the versatility of its author. Here, to be sure, we do not find the same delicate subtleties of curve in stylobate, columns, or entablature, which occur in the Parthenon, either because the architect recognised that such

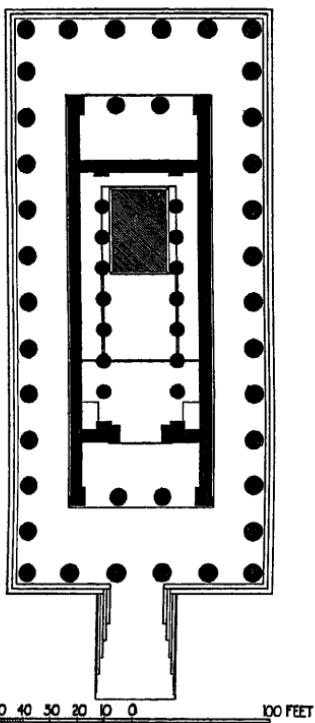
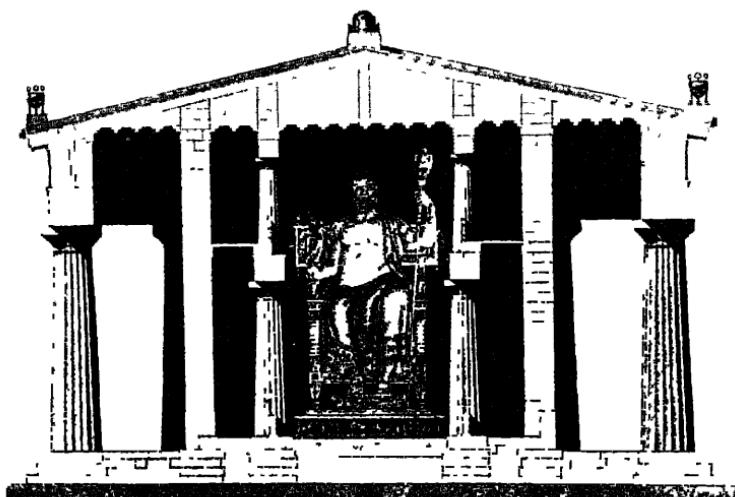


FIG. 40  
TEMPLE OF ZEUS AT OLYMPIA

\* A similar precaution was taken in the Parthenon, except that in the latter only water was required to counteract the intense dryness of the Acropolis.

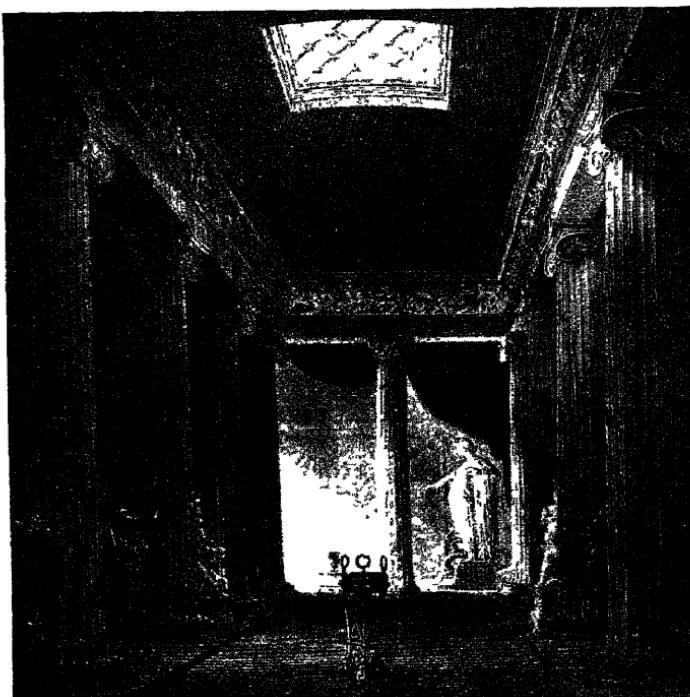


FAÇADE OF THE TEMPLE OF ZEUS AT OLYMPIA  
(RESTORED BY J. K. SMITH).

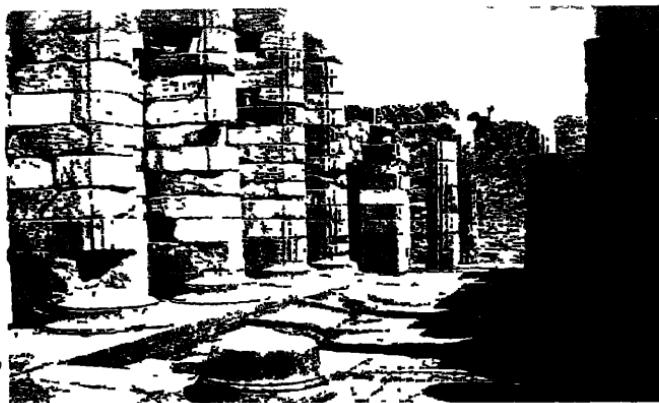


SECTION OF THE TEMPLE OF ZEUS AT OLYMPIA  
(RESTORED BY J. K. SMITH).

PLATE XXXI.

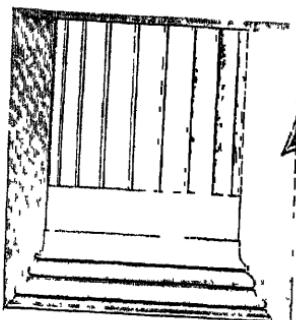
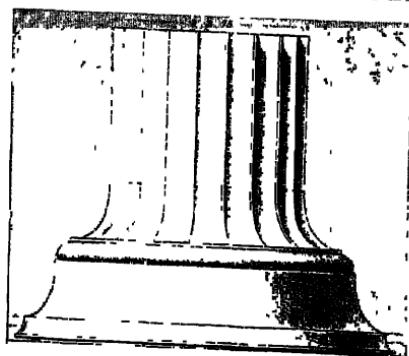
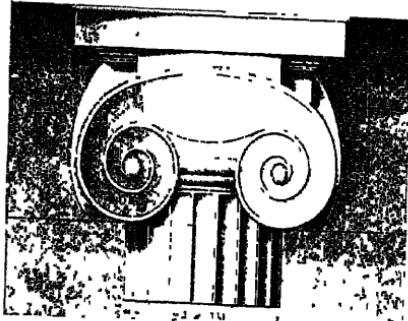


INTERIOR OF THE TEMPLE OF APOLLO AT BASSAE,  
LOOKING SOUTH (RESTORED BY COCKERELL).



INTERIOR OF THE TEMPLE OF APOLLO AT  
BASSAE, LOOKING NORTH.

PLATE XXXII.



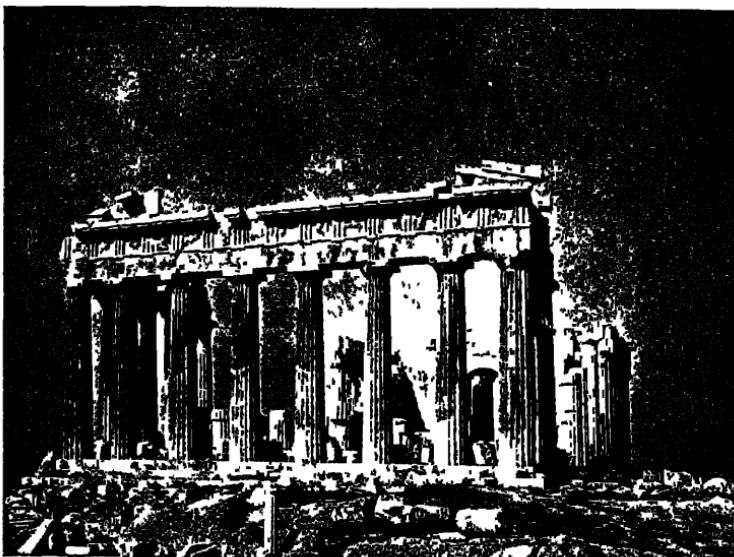
IONIC ORDER AT BASSAE.

CORINTHIAN ORDER  
AT BASSAE

PLATE XXXIII.



THE TEMPLE OF APOLLO EPICURIUS AT BASSAE.



THE PARTHENON AT ATHENS, FROM THE EAST.

refinements were not easily reproduced in any other material than Pentelic marble, or because the extraordinary labour and accuracy required in the work at Athens were of so costly a nature that they were not likely to be undertaken in these inaccessible mountains. On the other hand, the plan (Fig. 41) departs from the usual conventional arrangements in detail, and new features are introduced which, in Athens, might have been thought to have too progressive a tendency. The plan of the temple runs north and south instead of east and west, and behind the cella is a second chamber with a doorway facing the east. It is possible that this covers the site of an earlier and smaller temple dedicated to Apollo, facing eastward, which the architect was instructed to bring into his design; and this would account for the unusual length of a temple of this period which, though hexastyle on the façades, has fifteen columns on the flanks. Externally the temple is Doric (Plate XXXIII), but on both sides of the cella are Ionic semi-columns (Plate XXXI), which are attached to the cella wall by short spur walls, and midway between the southernmost pair of Ionic semi-columns stood an isolated Corinthian column, separating the main cella from the inner compartment in which was the statue of the god, illuminated through the eastern doorway. Very peculiar is the close juxtaposition of the first pair of spur walls to the massive masonry of the north doorway, and also the diagonal arrangement of the spur walls at the south end of the cella. Between the semi-columns were thus formed niches for votive offerings and statues, and the floor of the central portion of the cella was slightly sunk, not to form an impluvium as at Olympia, but merely to emphasise the Ionic bases by raising them as if on an internal stylobate.

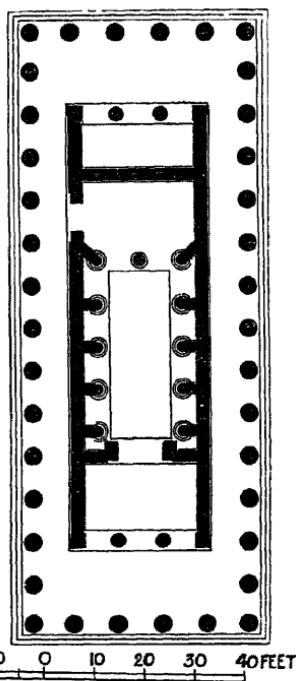


FIG. 41.—TEMPLE OF APOLLO  
EPICURIUS AT BASSAE

The capital of the Ionic order in the cella (Plate XXXII) is a new and original feature, designed to meet special requirements. Having only a semi-column to deal with, and desiring to detach completely three sides of his capital, the architect designed one with angle volutes at each corner. Instead of carrying across horizontally the fillet which connects the two volutes of the ordinary Ionic capital, and which in this case, owing to the concave plan of the volutes, would have appeared to dip in the centre, he raised it and with a fine sweep made it a continuation of the curves of the volutes. The raising of the upper fillet, however, resulted in another difficulty, that of designing an abacus to fit it ; \* and the result is not quite satisfactory. Like the volute cushion, the abacus is also concave in plan. The capital is not set out on the same axis as that of the shaft, and the side faces are slightly different from that on the front. The capitals of the southernmost Ionic columns did not align with the diagonal spur walls behind them, but agreed with the others in aligning with the architrave and thus aligned also with the abacus of the Corinthian capital at the end of the cella. This latter was the oldest example of the order known (Plate XXXII), and possibly antedated its supposed invention by Callimachus as mentioned by Vitruvius ; or, if we accept the story of the invention, assuming that Callimachus was the first to apply the acanthus decoration to the older form of bell capital as illustrated in the archaic treasures at Delphi, we must regard the example at Bassae as one of the earliest designs produced by him or under his immediate influence.† The two girdles of acanthus

\* In the first publications of this temple, in the *Antiquities of Athens* (suppl. vol.) and in the *Expédition Scientifique de Morée*, no abacus is shown ; but it appears to have been carved out of a separate block (of which Cockerell gives the drawing) not known to the earlier investigators, though the special bed for it exists at the tops of the spur walls.

† Vitruvius informs us that the capital was invented by Callimachus at Corinth. Now Callimachus was the craftsman who is said by Pausanias to have made a golden lamp for the goddess Athena Polias in the Erechtheum, and probably also the bronze palm tree reaching to the roof which drew off the smoke. As the earliest Greek Corinthian capitals all suggest a metallic origin, and as Callimachus is known to have worked both in bronze and in marble, it may be conjectured that he reproduced in marble a type of capital which was copied from one in bronze. Pausanias refers also to Corinthian bronze, which he says "got its colour by being plunged red hot into this water," referring to the fountain of Pirene. Corinthian bronze, for various reasons, was celebrated in ancient times, and Pliny says that the porticus built at Rome by Cneius Octavius was called Corinthian from its brazen Corinthian capitals. The title, therefore, may have been given either because the capital was invented by Callimachus at Corinth, or on account of the material in which the first prototype was wrought.

leaves at the bottom, the fleuron (here a palmette) at the middle of each face, the eight pairs of volutes, and the abacus with its concave sides, are all here present, though in somewhat rudimentary form. This marble Corinthian column, and the marble Ionic capitals, together with their entablature, seem to be slightly later than the rest of the cella, which is of limestone.

Above the Ionic and Corinthian capitals was a complete Ionic entablature, with a frieze richly carved with figure sculpture (now in the British Museum) inserted between the architrave and cornice. This complicates the question of the restoration of the ceiling, since transverse beams laid across the cella, supporting a horizontal wooden ceiling in the usual manner, would have ruined the effect of the frieze so far as its lighting was concerned. An alternative would be to omit the entire ceiling within the area enclosed by the frieze, and to leave a corresponding hypaethral opening in the roof ; \* but this would give the same ugly external effect of a notch in the ridge line to which we have previously found objection. This, nevertheless, was the scheme adopted by Cockerell, though he reduced the area of the hypaethral opening by assuming that at the centre the rafters were self-supporting cantilevers, the ridge being omitted and their weight taken entirely by the Ionic entablature with the wall above ; but this large *opaion* does not seem to be a possible solution of the problem,† and, moreover, the moulding represented as enframing it does not exist. We must, therefore, assume that the roof was continuous throughout the length of the temple. The marble roof tiles at Bassae are of such marvellous workmanship, and fitted one another so exactly, that they were probably carried directly on the rafters, without the interposition of the close boarding and bed of mud which were necessary for the terra-cotta tiles of other buildings. These marble tiles measured 3 feet 6½ inches long by 2 feet 5¼ inches wide (being the largest tiles known) ; seven of them on each side covered the slope of the roof (exclusive of the ridge and eaves

\* The sunken area in the floor below, sometimes regarded as evidence for a hypaethral opening above, in reality had quite another function, as previously noted.

† In the Taylor Buildings at Oxford, designed by Professor Cockerell, the staircase hall is covered with a roof of similar design and with a skylight in the centre. Round the wall, and at the same distance from the skylight as in his restoration of the temple, Cockerell had the Bassae frieze reproduced ; the result, however, as regards the lighting of the figures, is disastrous, two-thirds of them being in shadow.

tile), the cover tile being worked in the same slab at one side of the main tile (Fig. 42). The translucency of these tiles was so great that through them the cella might have been flooded with light had the ceiling been omitted. But here again, as at Olympia, portions of tiles were found with openings pierced in them, edged with raised rims to prevent the rain running down through them; \* one of these seems to show two corners, which would give for the rectangular opening a length of about 22 inches, and, the distance from the centre of the cover tile to the inside of the rim being  $7\frac{1}{2}$  inches, a width of  $9\frac{1}{2}$  inches, always supposing that each piercing was confined to one tile as in the other instances known.

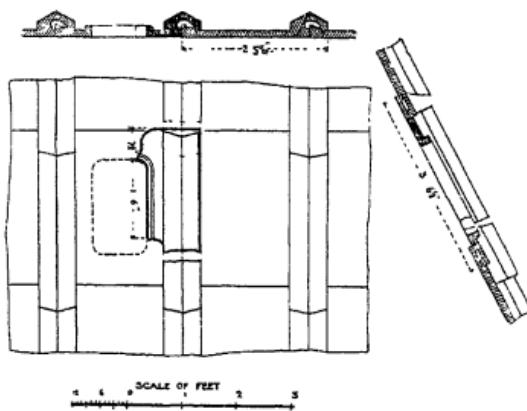


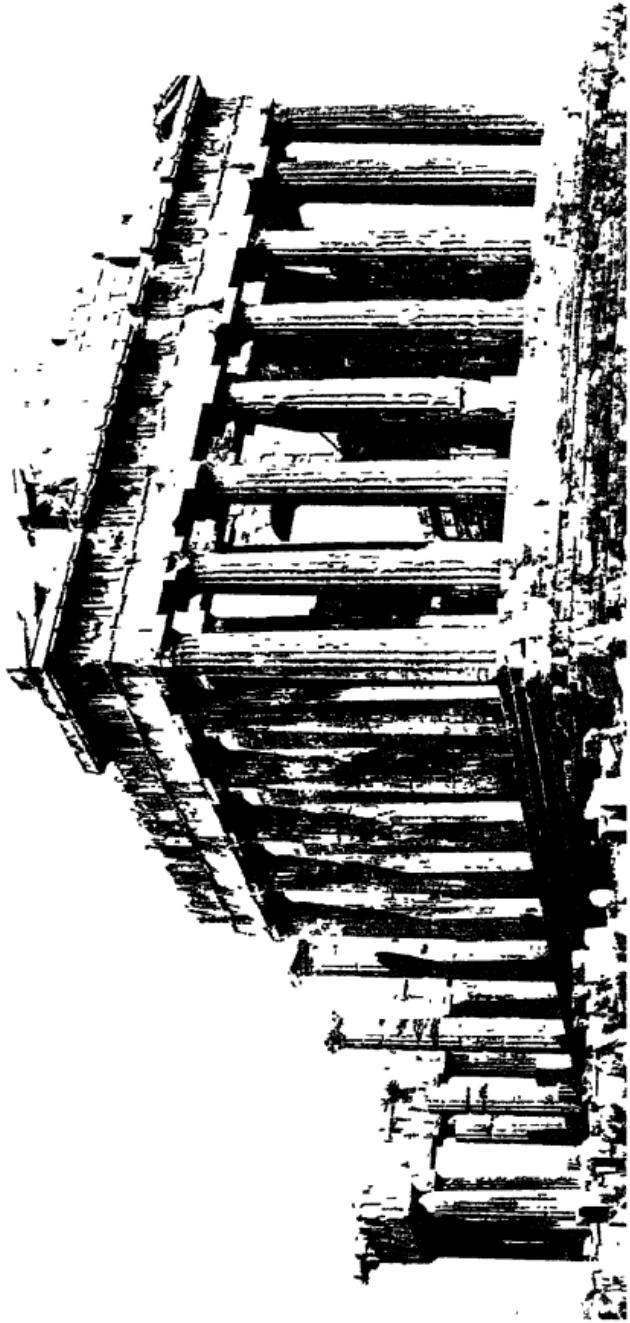
FIG. 42.—ROOF TILES AT BASSAE.

Covering the cella in the length are eighteen tiles, and on each slope are two tiles below the ridge tile; if a certain proportion of these seventy-two tiles were pierced, the openings,  $9\frac{1}{2}$  by 22 inches, would have afforded ample light to the cella, and the amount of rain which would fall into them would not be considerable. Below such a roof the ceiling could be restored on one of three ways. It might have been wholly omitted, exposing to view the under surfaces of the wooden rafters and marble roof tiles; † but

\* Cockerell found a piece of one of these pierced tiles, which he used for his opaion. In a second visit paid by Baron Haller, who was Cockerell's companion at Bassae when the temple was first explored by him, two other pierced tiles were found, drawings of which were published by Papworth in 1865.

† Cockerell's restoration, with the opaion, exposes only a portion of the timber rafters, and these he masked inside with linings and coffers. In the second edition of this work it was suggested that the rafters might have been of marble, hollowed out to diminish their weight like the ceiling beams

PLATE XXXIV.





this type of construction, frequent enough in secular colonnades and other buildings, would have been unprecedented in a temple. Another form was suggested in a sketch of the interior by Cockerell (Plate XXXI), in the form of a segmental vault with a central opening, though no reference to it was made in his description ; apparently the unusual arrangement of the spur walls in plan gave him the idea that there was a thrust of some kind to be resisted. But neither this form, which does not seem Greek, nor a flat ceiling with a correspondingly large opening, would be free from the objection that it would concentrate all the available light in one spot and leave the rest of the frieze in shadow. It seems preferable, therefore, to adopt a third solution, employing the customary horizontal coffered ceiling with transverse wooden beams across the cella, but leaving numerous framed openings in the coffers or sunk panels, possibly alternating with the openings in the tiles above, in order to obtain an effect of diffused light.

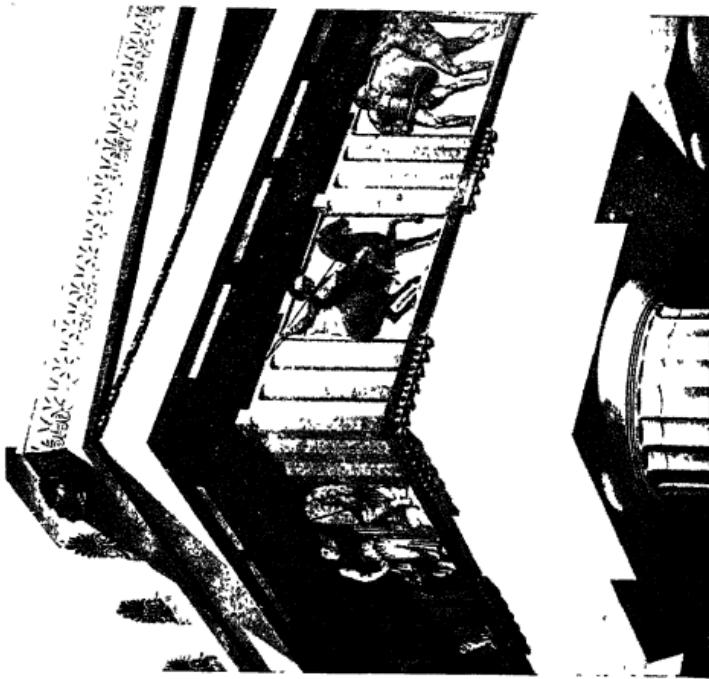
It is at Athens that we may best study the works of the culminating period ; and it is on the Acropolis that we find the masterpiece of all these works, the Parthenon. The work of Ictinus and Callicrates in partnership, it was executed in a period of ten years, from 447 to 438 B.C., and after its dedication in the latter year the labour of the sculptors was continued until the outbreak of the Peloponnesian War in 432 B.C. The site was the lofty platform already prepared on the south side of the Acropolis for the Older Parthenon, a site which not only made it the principal crowning feature of the Acropolis as seen from the south and west (Plates I, XLV and XLVII), but on the Acropolis itself rendered it the most imposing structure there (Plates XXXIII, XXXIV and XXXV) so that it was worthy of the various subtleties both in line and in proportion that it was to receive at the hands of Ictinus and Callicrates, and of its enrichment by Phidias with the most beautiful sculpture that the world has seen. Fortunately there remains enough of the exterior to enable us to restore it more or less

of the north and south peristyles (the clear spans being about 7 feet for the rafters as compared with 13 feet for the ceiling beams), with the marble tiles resting directly upon them. Then there would have been no necessity to hide them internally or to fill the intervals between ; and such a scheme of construction would have accorded with the statement of Pausanias, "The temple of Apollo, the Succourer, is built of stone, roof and all," a description never given of any other temple.

completely in our imagination.\* The plan (Fig. 51, GH) is more pretentious than that of any other Doric temple erected on the Greek mainland, recalling temple "GT" at Selinus with its octastyle façades and seventeen columns on the flanks; the size, however, is considerably smaller than in its great Sicilian prototype. The new plan did not agree with that of the older platform (Fig. 51, I-I), which was left unoccupied for a length of 14 feet at the east end, and likewise for 5½ feet at the south; on the other hand, the new building overlapped the old platform by 11 feet at the north, requiring additional foundations of this width along the north flank. The plan of the building within the peristyle shows two distinct chambers, the cella proper with its pronaos facing the east (Fig. 51, H), and a rear chamber with its porch or opisthodomus facing the west (Fig. 51, G). The term Parthenon given to the whole building is a later title, and was confined at first to the rear chamber, which was officially known as the Parthenon (chamber of the Virgin) and was used as a treasury; the cella was known as the Naos Hecatompedos (cella of 100 feet), this being its approximate, though by no means its exact, length. In the cella there were ten columns on either side, and three columns at the west end in addition to those at the corners. These are considered to have carried an architrave with superposed columns above, as in the temples at Aegina and Paestum already mentioned; the primary object of these columns would seem to have been the support of the beams of the ceiling and roof, as there is no evidence for galleries. The three columns at the west end show that the aisle was carried round the interior of the cella, with bronze barriers fixed between the columns, so as to allow privileged travellers like Pausanias to walk round the chryselephantine statue of Athena and see it on all sides; a similar arrangement existed in the temple of Zeus at Olympia, except that there were no columns at the west end, a space merely being left at the back of the pedestal to permit one to pass round. The ceiling of the treasury or Parthenon, on the other hand, was probably carried by four Ionic columns, of which traces of the bases have been found on the pavement; the reason for the employment of this order was the desire to avoid the superposed storeys of columns, which in such a shallow room would have

\* The north flank, furthermore, is now being rebuilt by piecing together the scattered fragments.

PLATE XXXV.



THE NORTH-WEST CORNER OF THE  
PARTHENON.

DETAIL OF THE NORTH-WEST CORNER OF THE  
PARTHENON (RESTORED BY FINGER).

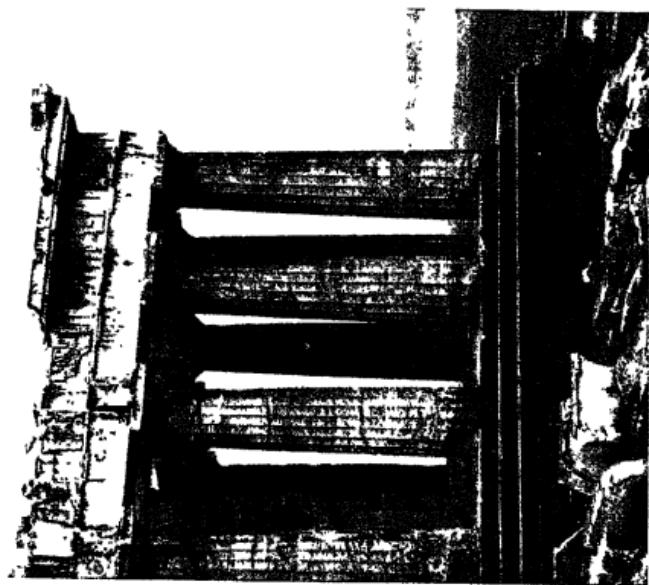
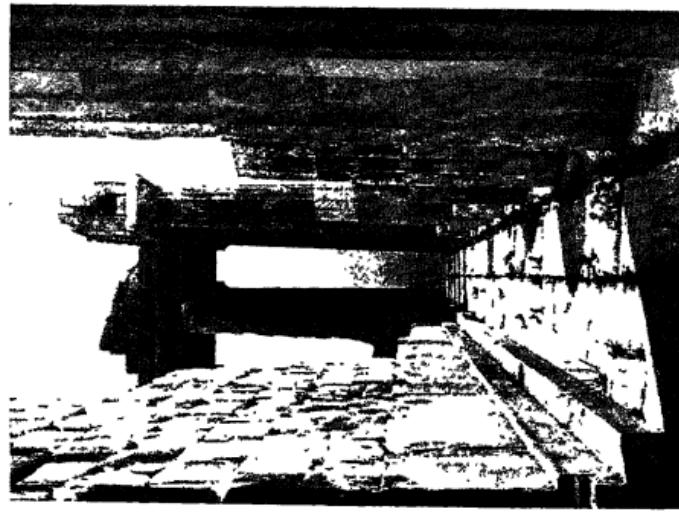


PLATE XXXVI.



DORIC FRIEZE OF THE PARTHENON, SHOWING CONTINUOUS  
IONIC FRIEZE BEHIND, WEST FRONT.



THE SOUTH PERISTYLE OF THE PARTHENON,  
LOOKING EAST.

seemed rather absurd, and yet at the same time to occupy less floor space than would have been required for Doric columns tall enough to reach the ceiling.

The temple is so well preserved, in its essential parts, that Penrose was enabled to measure mathematically those subtle refinements both in design and construction which make it the most remarkable building in the world. In speaking of these refinements, Professor Percy Gardner says : "The whole building is constructed, so to speak, on a subjective rather than an objective basis ; it is intended not to be mathematically accurate, but to be adapted to the eye of the spectator. To the eye a curve is a more pleasing form than a straight line, and the deviations from rigid correctness serve to give a character of purpose, almost of life, to the solid marble construction."\* The delicate curves and inclinations of the horizontal and vertical lines were first noticed by Cockerell (1810), Donaldson (1818), and Hoffer and Pennethorne (1836-1837), and in 1846 were measured by Penrose, who published his well-known work on the subject in 1851, a second edition of which, with further notes, appeared in 1888. The rising curves given to the stylobate and entablature in order to give a feeling of life and to prevent the appearance of sagging,† the convex curve to which the entasis of the columns was worked in order to correct the optical illusion of concavity which might have resulted if the sides had been straight,‡ and the slight inward inclinations of the axes of the columns so as to give an appearance of greater strength,§ all entailed a mathematical precision in the setting out of the work and in its execution which would have been impossible in any other material than the Pentelic

\* Gardner, *Grammar of Greek Art* (1905), p.39.

† First noticed by Hoffer and Pennethorne. The three steps of the platform are virtually of equal height throughout ; consequently the rise had been already attained in the substructure. This was done partly by trimming the top course of the basement of Piraeic stone, and partly (on the north flank) by reducing the thin marble levelling course immediately under the platform towards the corners. As for the entablature, Vitruvius seems to have assumed, and probably rightly, that the curve followed and was a consequence of that of the stylobate. Penrose on the other hand argued that the reverse was the case ; that Ictinus, in order "to obviate a disagreeable effect produced by the contrast of the horizontal with the inclined lines of a flat pediment," which gave an apparent dip to the former, decided that the horizontal lines must rise towards the middle, which require a similar rise in the stylobate in order that the columns might be of equal height.

‡ First noticed by Cockerell, and afterwards measured and verified by Penrose.

§ First noticed by Donaldson, and subsequently measured by Penrose.

marble with which it was built. The upward curvature of the stylobate (*cf.* Fig. 43) in the Parthenon amounts to  $2\frac{1}{4}$  inches on the façades and to  $4\frac{3}{8}$  inches on the flanks ; the radius of the latter curve, an arc of an enormous circle, is about  $3\frac{1}{2}$  miles. The entasis (*cf.* Fig. 44) is probably likewise a circular arc,\* with a maximum increment of about  $\frac{1}{8}$  inch, so that the radius would have been nearly half a mile. The inward inclination of the columns (Fig. 45) was  $2\frac{1}{8}$  inches ; it may be calculated that the axes of the columns on the two sides of the Parthenon, if prolonged, would meet in a line more than one and a half miles above the pavement ; the axes on the two façades being inclined at the same rate, it is apparent that the axes of the angle columns, being inclined both

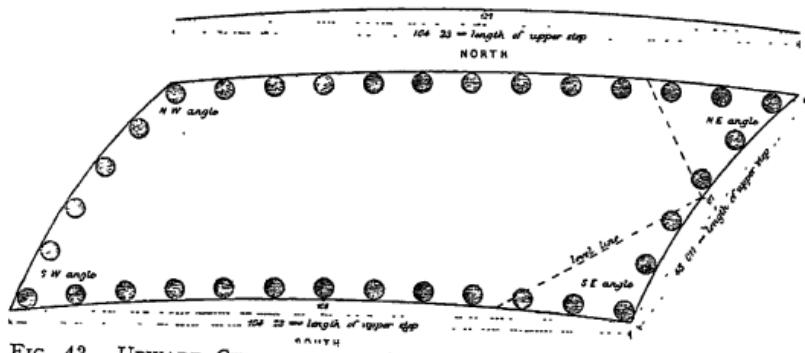


FIG. 43.—UPWARD CURVATURE OF STYLOBATE (THESEUM), EXAGGERATED.

ways on a diagonal line, have a greater inclination in the proportion of the diagonal to the sides of a square. The sides of the abacus in some buildings had a slight inclination, partly on account of the inclined axis of the column, and partly to correct certain optical illusions which presented themselves to the acute observance of the architect ; and similar inclinations occurred also in most members of the entablature and pediment ; these would seem to be due to the position from which the building was seen, and to its illumination by the sun's rays. These refinements vary in different temples and are not found in some, as, for instance, the temple at Bassae ; and the curves at least are lacking in the temple of Athena Nike and in the east portico of the Erechtheum. The entasis is most delicate in the Erechtheum (the amount of deflection

\* Penrose argued that it was rather a section of a hyperbola.

from a straight line being less than  $\frac{1}{4}$  inch), and is most pronounced in early examples such as the "Basilica" at Paestum (where the deviation is  $2\frac{1}{2}$  inches, Fig. 44, I), or in late examples such as the temple of Zeus Olympius at Athens (where it is  $1\frac{1}{2}$  inches).\*

Although the Greek architects seem usually to have preferred in their mouldings regular geometrical curves such as the hyperbola, the parabola, and the ellipse, especially for convex mouldings where perfection of contour is more important than in concave mouldings, yet for the fluting of the columns in the Parthenon an approximate curve struck from three centres, and known as a false ellipse, was adopted (according to Penrose) : the central portion of the curve had a radius equal to the width of the flute, and the radii of the portions on either side diminished with the decreasing depth of the flutes in the upper portions of the shaft, the principal object throughout being to accentuate the arris. In the Propylaea, as also in most of the earlier Doric examples in southern Italy and Sicily, the curves were segments of circles.

The Parthenon being a completed work, the evidence for the method of its construction and finish is mainly derived from other Greek buildings which for various reasons have never been terminated, such as the temples of Nemesis at Rhamnus, Demeter at Eleusis, Zeus at Stratos, and Apollo at Delos, the so-called stoa at Thoricus, and the temple "GT" at Selinus and that at Segesta already mentioned, from the last of which it may be inferred that the peristyle of a temple was the first part erected (Plate XXIII). In all these temples the columns are still unfluted, and the treads and risers of the steps retain their rough unworked surfaces, being drafted at their junction so as to obtain fine joints ; often they retain also the ancones or

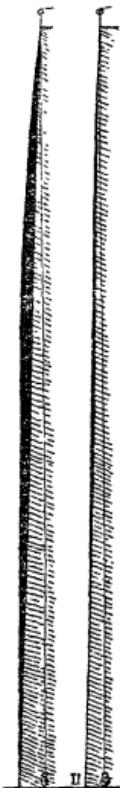


FIG. 44.  
ENTASIS OF  
DORIC  
COLUMNS.

\* The comparative entasis given approximately by Penrose (*Athenian Architecture*, p. 40) is twelve for the temple of Zeus Olympius, eleven for the larger and nine for the smaller order of the Propylaea, and eight, six, and four for the Parthenon, Theseum, and Erechtheum respectively, the height of the column being regarded as uniform.

ears, projecting bosses by which the stones were lowered into their positions.\* The gradual rise of the stylobate was constructed, according to Vitruvius, by means of the *scamilli impares*; his remarks on this subject are not clear, but it is probable that he referred to the formation of the curve, on the top course of the foundations, by means of levelling cubes of various heights, so arranged that when their tops lay in a horizontal plane, their bottoms described the proper curve and indicated to what depth the foundation course had

to be dressed. Where the stylobate received the lowest drum of the column the surface was sunk to its proper depth (Fig. 46), and on this were traced the diameters marking the axis of the column and a circle forming its circumference; the area within this was worked lightly over to give some hold to the lower surface of the drum of the column. On the lowest drum, in the Doric columns, the flutes were finished for 2 or 3 inches in height, the rest being left roughly circular. At the upper

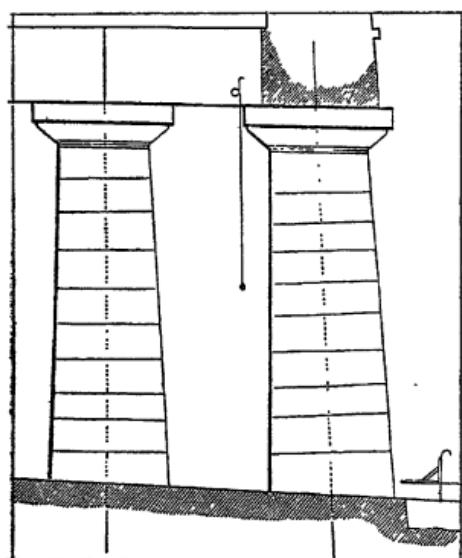
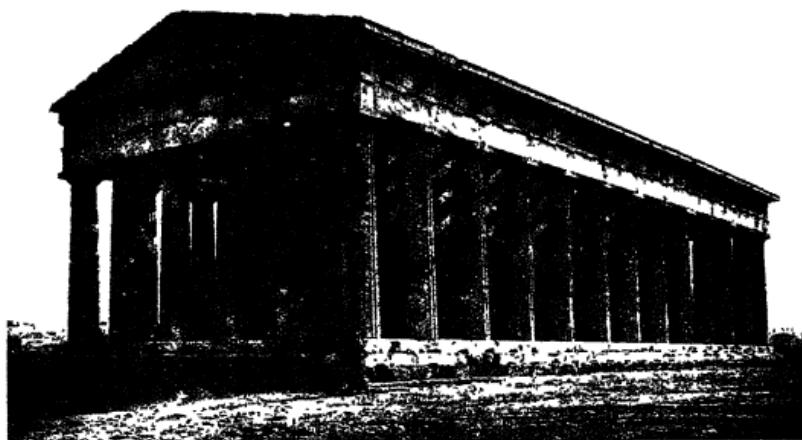


FIG. 45.—INCLINATIONS OF DORIC COLUMNS,  
EXAGGERATED.

joints the arrangement was different. There a square sinking was made in the centre of the upper and lower surface of each drum (Fig. 46), about 4 to 6 inches square and 3 to 4 inches deep, in which plugs of cypress wood were fixed; at the exact centre of the drum a round hole about 2 inches in diameter was bored in each plug, so that a circular wooden pin, inserted in the hole at the bottom of a drum, would fit the corresponding hole in the top of the drum below, forming a simple method of centring

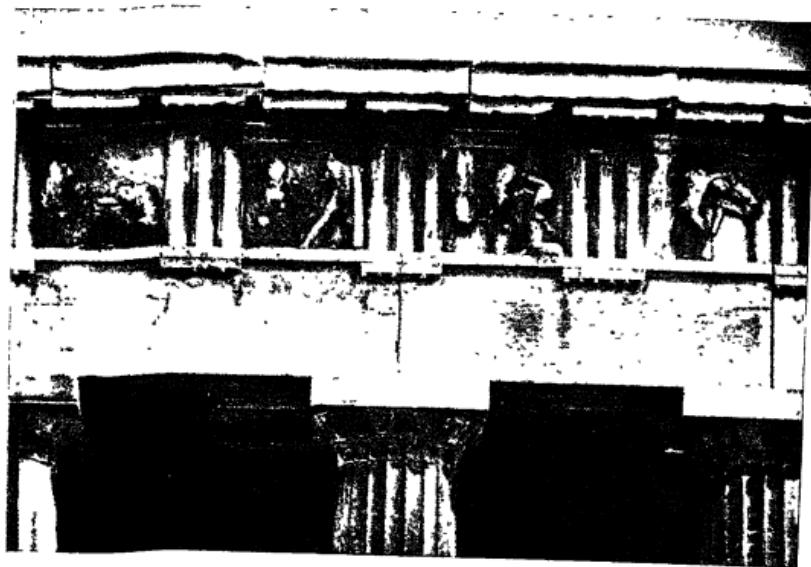
\* It seems improbable that, as is sometimes assumed, the bosses were used also to work the stones backwards and forwards in order to grind the joints.



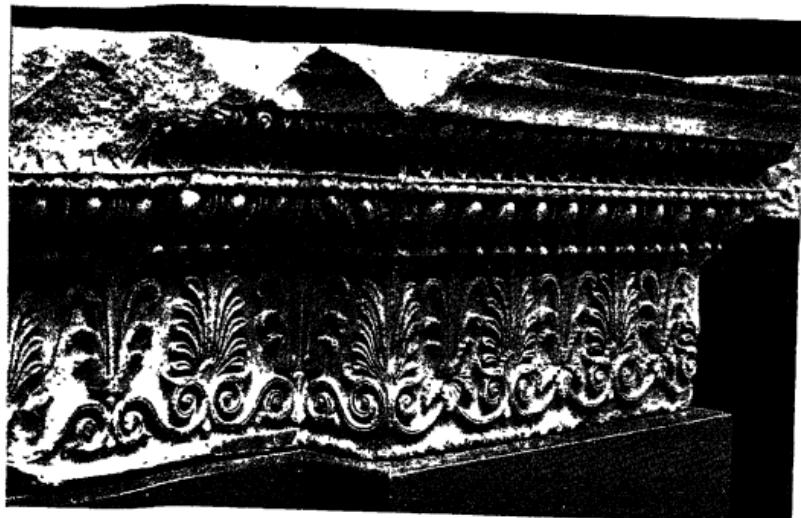
THE THESEUM FROM THE WEST.



THE TEMPLE AT SUNIUM FROM THE EAST.



DORIC FRIEZE OF THE THESEUM, SOUTH FLANK.



ANTA CAPITAL FROM THE ERECHTHEUM (BRITISH MUSEUM).

the drums accurately one upon another.\* Between the centre and the circumference several concentric circles appear on the bed of the drum, the outermost ring being smoothly polished to form a joint that was practically invisible, while the next zone was slightly roughened in order to give the drums better hold upon each other; a third zone was slightly depressed, with the object of reducing the amount of surface that was actually in contact; and generally there was an innermost zone, rising again to the level of the joint, immediately round the wooden plug mentioned above. There are from ten to twelve of these drums in each column of the Parthenon. None of the drum joints was truly horizontal, all being perpendicular to the inclined axis of the column (Fig. 45). But

on the lowest drum, in consequence of the curve of the stylobate, the side toward the corner of the building had to be carried down a fraction lower than on the side toward the central axis of the building, and likewise, both on account of the curvature and because of the inward inclination of the column axis, the outer face had to be carried down considerably lower than the back (toward the cella wall).† Similar difficulties were experienced with the uppermost

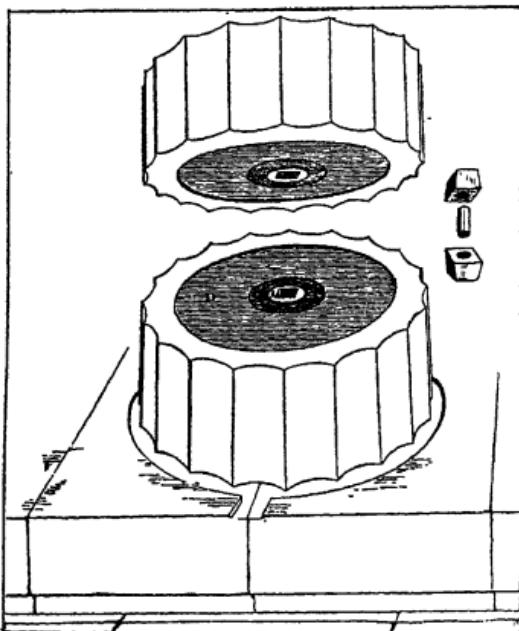


FIG. 46.—CONSTRUCTION OF COLUMNS, SHOWING CENTRING PIN.

\* In the earlier editions of this work it was assumed that the wooden pins were really pivots on which the drums were worked round so as to grind the blocks closely together, a theory evolved by Penrose, against which there are numerous grave objections.

† Penrose and other authorities have applied to the variations of height on the different sides of the lowest drums, due to their adjustment both

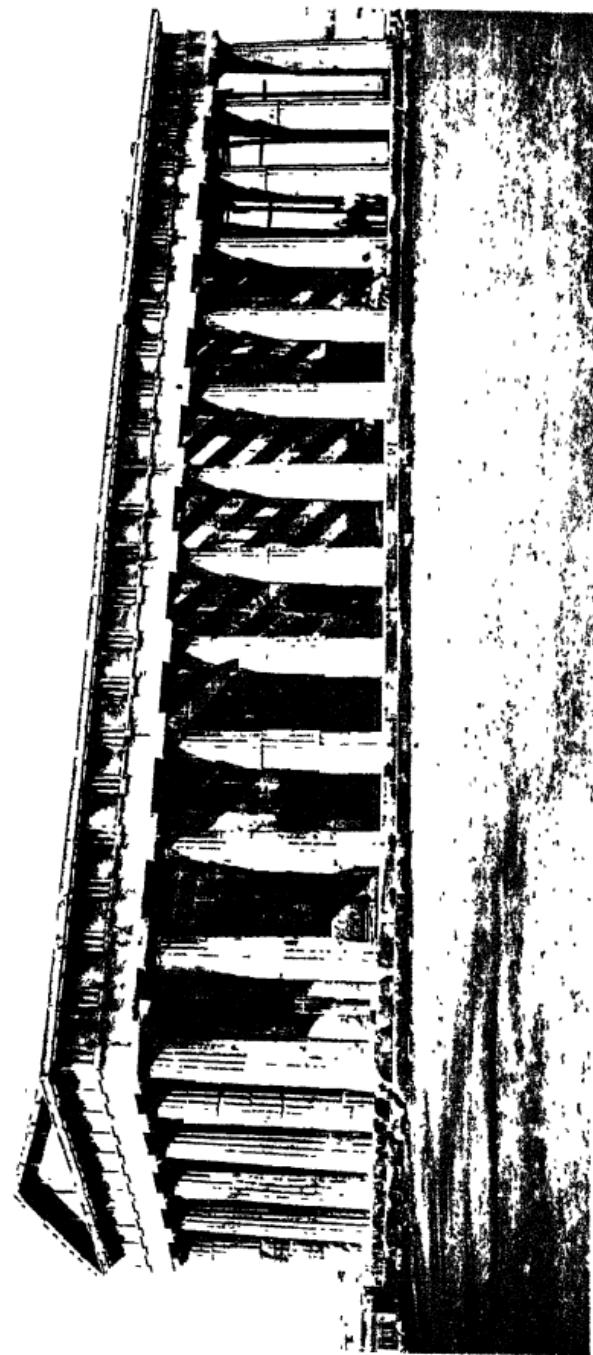
drums, because of the necessity of presenting for the bed of the capital a plane parallel to the soffit of the architrave. The necking of the capital was also fluted to correspond to the bottom of the shaft, and the echinus was perfectly finished\* ; but on the abacus must have been left unworked surfaces or corners to protect them. The walls were likewise built up with their faces completely enveloped in the unworked surfaces, and with the lifting bosses still remaining on the blocks ; the vertical joints were hollowed with the exception of a polished band  $2\frac{1}{2}$  or 3 inches wide round the edges, in order to secure closer contact ; and all the joints, both horizontal and vertical, were left with a slight bevel intended to prevent chipping when the blocks were placed together. All the blocks were laid dry, without mortar ; for a bonding material was used iron, dowels to fasten the blocks to those below them, and clamps of double-T form to connect blocks in the same course, all sealed in molten lead. The members of the entablatures and ceilings appear to have been set in place practically complete ; the unworked surfaces with a few exceptions were confined to the platform and columns and walls, these being the portions most liable to injury during the process of erection. On the completion of the temple the fluting of the columns was worked from top to bottom with that delicate entasis which gives such beauty to its outline ; the faces of the walls were dressed and rubbed so that the bevels at the joints, and almost the joints themselves, disappeared ; and the treads and risers of the steps were worked down to their smooth surfaces.

As for the sculptures of the Parthenon, of which the most representative portions are in the British Museum, it is apparent that the metopes (Plates XXXV, XXXVI), being constructed separately from the triglyphs and afterwards slipped into place, were probably carved on the ground before being raised to their positions ; and this conjecture seems to be verified by the differences in the style of the sculptured slabs themselves. On the other hand, the continuous Panathenaic frieze on the external walls of the cella formed an integral part of the structure, and was probably carved *in situ* ; a remarkable feature of it is the location of such sculpture

to the curved stylobate and to the inclination of the columns, the term *scamilli impares* used by Vitruvius ; but evidently the latter was referring only to the stylobate construction.

\* There is no assumption for the statement that it was turned in a lathe.

PLATE XXXIX



THE THESEUM AT ATHENS, FROM THE SOUTH-WEST.



in a position where it could hardly be appreciated (Plate XXXVI). Nothing was said by Pausanias about this frieze, representing the procession which took place every four years during the Panathenaic festival; it starts from the south-west angle, running east and north, and meeting over the pronaos, where the procession, headed on either side by the maidens selected to work the sacred robe and here represented as bearing religious offerings, arrives before the assembled gods who are grouped in the centre, seated, while behind them the old peplos is being folded up to be stored away. The figures decorating the pediments, the latest of the marble sculptures of the temple, are known to have been executed on the ground before being set in place. The only literary notice that we possess of the subject of the pedimental sculptures is from Pausanias, who says, "the whole subject of the pediment over the entrance (*i.e.*, the east pediment) is the circumstances of the birth of Athena, and that of the pediment at the back is the contest of Poseidon with Athena for the land." Drawings said to have been made by Jacques Carrey in 1674 give the positions of the figures in the west pediment, but in the east pediment the central group was already missing. Finally, a few words should be said about the chryselephantine statue of Athena, Phidias's masterpiece. This was constructed on a wooden core, having ivory for the face, feet, and hands, and gold for the drapery, ground, and accessories. Its position, standing well out in the central portion of the cella, is known from the traces of the pedestal on the pavement. The total height of the statue and its pedestal was twenty-six cubits (close upon 40 feet), and from the description of it given by Pausanias it is evident that the closest copy of it is found in a statuette discovered near the Varvakeion Gymnasium in Athens in 1880, and now in the National Museum, though in minor details it differs somewhat from the description.

The perfected type of the Doric hexastyle temple exists in the so-called Theseum, which owes its comparatively perfect preservation to the fact of its having been converted into a church by the Byzantine Greeks. It consists of a cella, with a pronaos and opisthodomus, and is surrounded by a peristyle with six columns on the fronts and thirteen on the flanks (Plate XXXVII, XXXIX). Its proportions are less satisfactory than those of the Parthenon, owing to the unfortunate combination of lighter columns with a heavier entablature. Only eighteen of the external metopes are

decorated with sculpture ; ten on the east front, and the four adjoining the east end on the north and south flanks (Plate XXXVIII) ; the pediments were also filled with statues which have now disappeared. A sculptured frieze runs above the pronaos and opisthodomus, in the former case being carried across also to the north and south peristyles. The relative proportion of diameters to heights of the columns and other details have led Dörpfeld and others to give it a later date than the Parthenon ; and, as the temple or heroum dedicated to Theseus is known to have been built by Cimon in 475 B.C., the existing building requires a different name, and is now generally recognised

as the temple of Hephaestus mentioned by Pausanias, in which case it must have contained the bronze statues of Athena and Hephaestus designed by Alcamenes, in 421 B.C. Similar temples were erected outside Athens, at Rhamnus and Sunium (Plate XXXVII), probably by the architect of the Theseum ; both show the use of slender proportions, of continuous friezes, and of carved ornament, which characterise the Ionic influence on the Doric buildings of this period. And of about

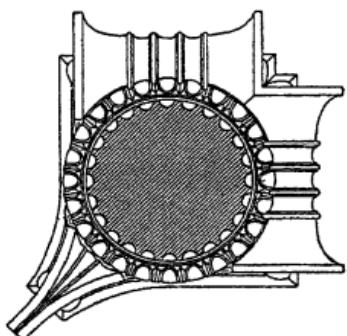


FIG. 47.—PLAN OF ANGLE CAPITAL, TEMPLE OF ATHENA NIKE.

the same epoch is a much larger Doric hexastyle temple dedicated to Hera near Argos, excavated by an American expedition in 1893 ; it was the work of the local Argive architect Eupolemus, richly decorated with sculpture and carved ornament, and contained the gold-and-ivory statue of Hera wherewith Polyclitus attempted to rival the Zeus of Phidias.

Temples purely Ionic in style likewise arose on Attic soil during this period. A small example on the Acropolis is that of Athena Nike, or Nike Apteros ("without wings"), which was planned before the adjoining Propylaea but was probably built subsequently, at about 426 B.C. (Plate XL, Fig. 51B). The architect was Callicrates of the Parthenon. The temple crowns the bastion on the south side of the west approach to the Acropolis, and seems to have been built on the site of an earlier temple or altar ; its north side rests on a very early polygonal

wall, and its axis, nearly due east and west, forms a marked angle with those of the Propylaea and the Parthenon. This temple disappeared for a time, having been taken down and utilised in the construction of a central bastion by the Turks; but on the destruction of this in 1835, the temple was rebuilt in the following seven years. At the same time were discovered many of the sculptured slabs which formed a parapet along the north, west, and south edges of the bastion, and these rank among the most beautiful sculptures of all periods. The temple itself, built of Pentelic marble, is of the Ionic order, amphiprostyle and tetrasyle—that is to say, it has prostyle porticoes of four columns each towards the east and west. There was still another small temple of very similar design in Athens, on the borders of the Ilissus (Plate XL), which was fortunately measured and drawn by Stuart and Revett before its destruction by the Turks in 1778. Although in no sense archaic, the entablature is of exceptional severity, the architrave being unbroken by fascias; and the cornice is without dentils, showing the same simple bed moulding that we find in the temple of Athena Nike and the Erechtheum; the date is probably about the middle of the fifth century.

The most elaborate of these Ionic temples, however, was that erected opposite to the Parthenon, on the north side of the Acropolis, called the Erechtheum (Figs. 48, 49, 51F; Plates XLI—XLIV), a building as complicated in its plan as the Parthenon is simple. It was built on two levels, had three porticoes of different design, and seems to have been a combination of two or three temples in one. Whether this irregularity was due to its occupying the sites of earlier buildings and the necessity of preserving intact certain spots sacred to the Athenians,\* or also in part to changes of plan during the course of erection, is not known with certainty; but the architect, whose name is also unknown (though that of Mnesicles has been suggested), would seem to have accepted the difficulties of the situation and to have designed a building which more than any other shows the elasticity of the Greek style. The main block, built to be seen from the higher level, covers an area of 37 feet by

\* It was on this site that, according to tradition, Athena and Poseidon are supposed to have contended for the dominion of Athens as represented in the west pediment of the Parthenon; and the mark of the trident in the rock, the well of sea water, and the sacred olive tree are all mentioned by Pausanias.

71 feet, including a prostyle hexastyle portico of six Ionic columns at the east end ; the west end of the block had, in Roman times at least, four semi-detached Ionic columns between antae, with three windows in the intervening walls.\* On the north side of the block was a broad flight of steps leading to the lower level, and at the western end of this north flank, but projecting also westward of the main block, is a prostyle tetrastyle portico of six Ionic columns, four columns in front and one behind each of the corner columns. On the south side, and likewise close to the west end (Fig. 48, D), is the Caryatid porch,† the marble roof of which is carried by six Caryatid figures, four in front and two behind, all

facing the south and standing on a podium about 6 feet high. Owing to many alterations, even in Roman times, and to the subsequent conversion of the temple, first into a church and then into a Pasha's residence, the restoration of the plan of the interior is necessarily conjectural. At distances of 25 feet and 48 feet respectively from the east wall of the cella are marks of the attachment of cross walls, which would divide the area into three chambers. Of these, the eastern chamber,

on the higher level, and entered from the

hexastyle portico of six columns, is supposed to have been the cella of Athena Polias (Fig. 48, A) ; and the central and western chambers were apparently divided only by a low screen and constituted the shrine of Erechtheus (Fig. 48, B). The sanctuary of Pandrosus is assumed to have been situated in the court to the west of the Erechtheum (Fig. 48, C), the entrance to this court, in which the olive tree grew, being through a side doorway in the north portico. The cistern containing the salt sea of Poseidon was evidently under the floor of the western

\* These were blown down during a hurricane in October, 1852, and the whole front was rebuilt in 1904, after examination of the remains had led archaeologists to the conclusion that both columns and windows were of Roman date, perhaps replacing four isolated columns in-antis in the original design.

† Tribune would be a better term ; for, although there is a narrow opening in the podium on the east side, this probably was intended for priests only, and did not form a proper entrance to the building.

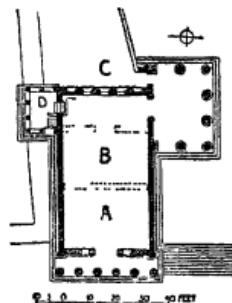
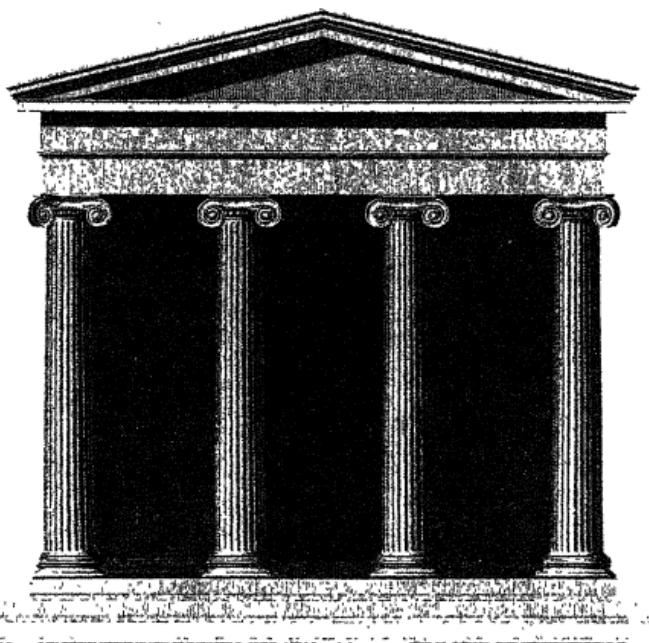


FIG. 48.—THE ERECHTHEUM



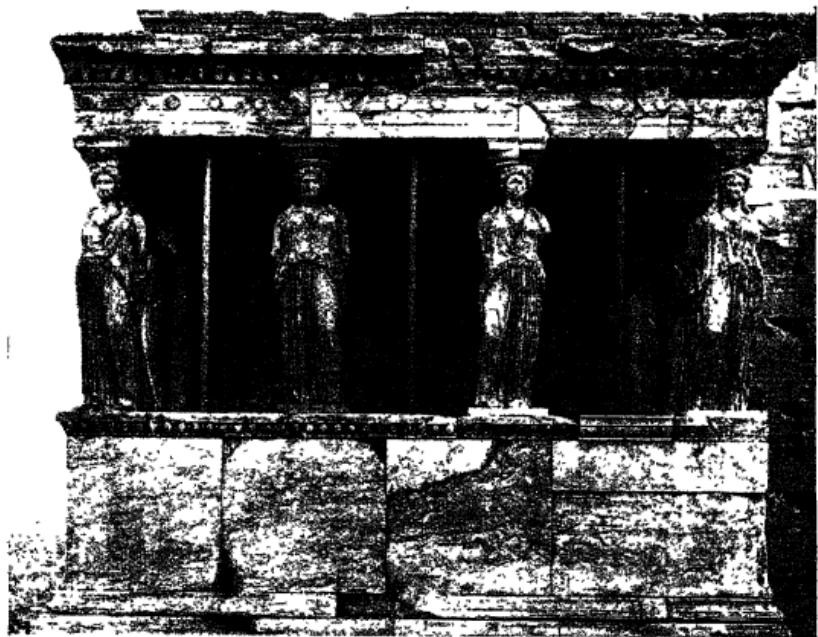
THE TEMPLE ON THE ILISSUS (RESTORED BY STUART & REVETT).



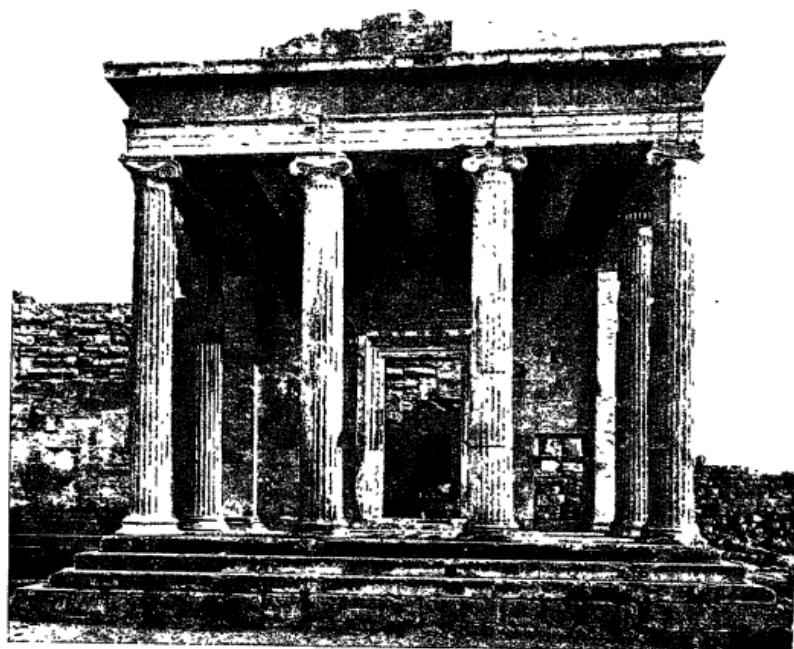
THE TEMPLE OF ATHENA NIKE, FROM THE EAST.



THE ERECHTHEUM FROM THE SOUTH-WEST.



THE CARYATID PORTICO OF THE ERECHTHEUM.

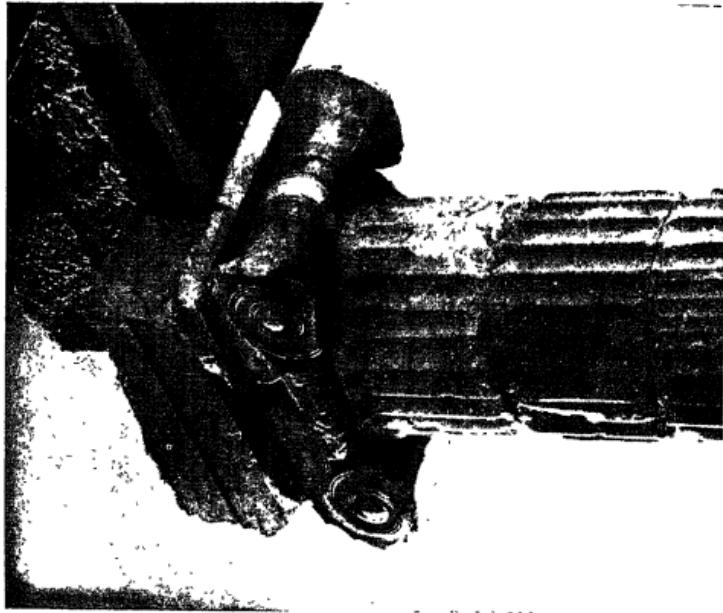


NORTH PORCH OF THE ERECHTHEUM.

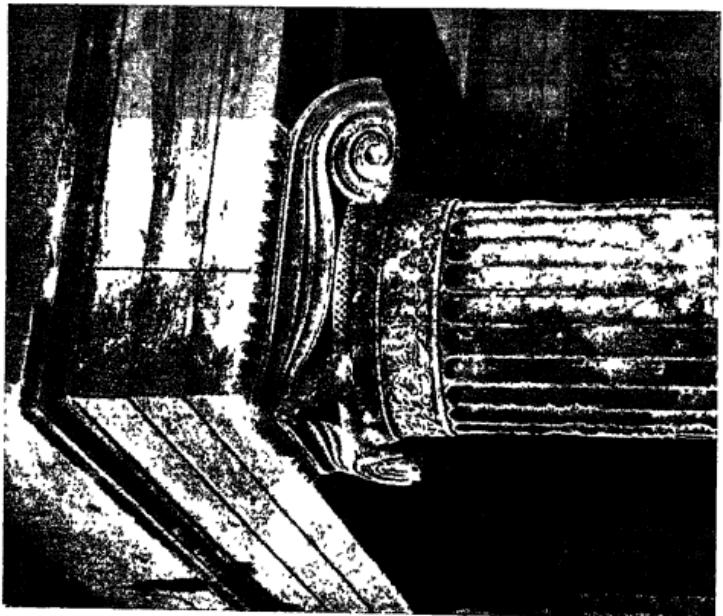


EAST FRONT OF THE PROPYLAEA AT ATHENS.

PLATE XLIII.



IONIC CAPITAL IN THE PROPYLAEA.



ANGLE CAPITAL IN THE NORTH PORCH OF  
THE ERECHTHEUM.

chamber of the temple\* ; and the indentations stated by Pausanias to have been produced by the trident of Poseidon were shown on the rock floor of a crypt under the north portico.

The whole temple was built in Pentelic marble, with black Eleusinian limestone for the frieze, to which figures in white marble were attached by clamps. The intercolumniations and the relative proportions of diameter to heights of columns vary in the different porticoes ; in the east portico (Plate XLIV Fig. 49) they are barely more than two diameters apart, and the relation of diameter to height is  $1 : 9\frac{1}{2}$  ; but in the north portico (Plate XLII) the columns are



FIG. 49.—EAST FAÇADE OF THE ERECHTHEUM,  
WITH WINDOWS. (Restored by Stevens.)

more than two and three-fourths diameters apart, and the relation of diameter to height is  $1 : 9\frac{1}{2}$ . The bases of the columns of the semi-detached columns of the west front (Plate XLI) are on a level 3 feet  $1\frac{1}{2}$  inches higher than those of the east portico ; but, while the height of the columns was made equal to nine diameters, the intercolumniation was made almost the same as in the east portico. The bases are of the ultimate form, the "Attic base," which was attained by adding, below the torus and hollow disk (simplified to a single scotia) of the Asiatic type, a lower torus which gradually increased in size until it became somewhat larger than the upper one. The capitals are of exceptional richness (Plate XLIII), with intermediate fillets in the volutes, connected in the form of a

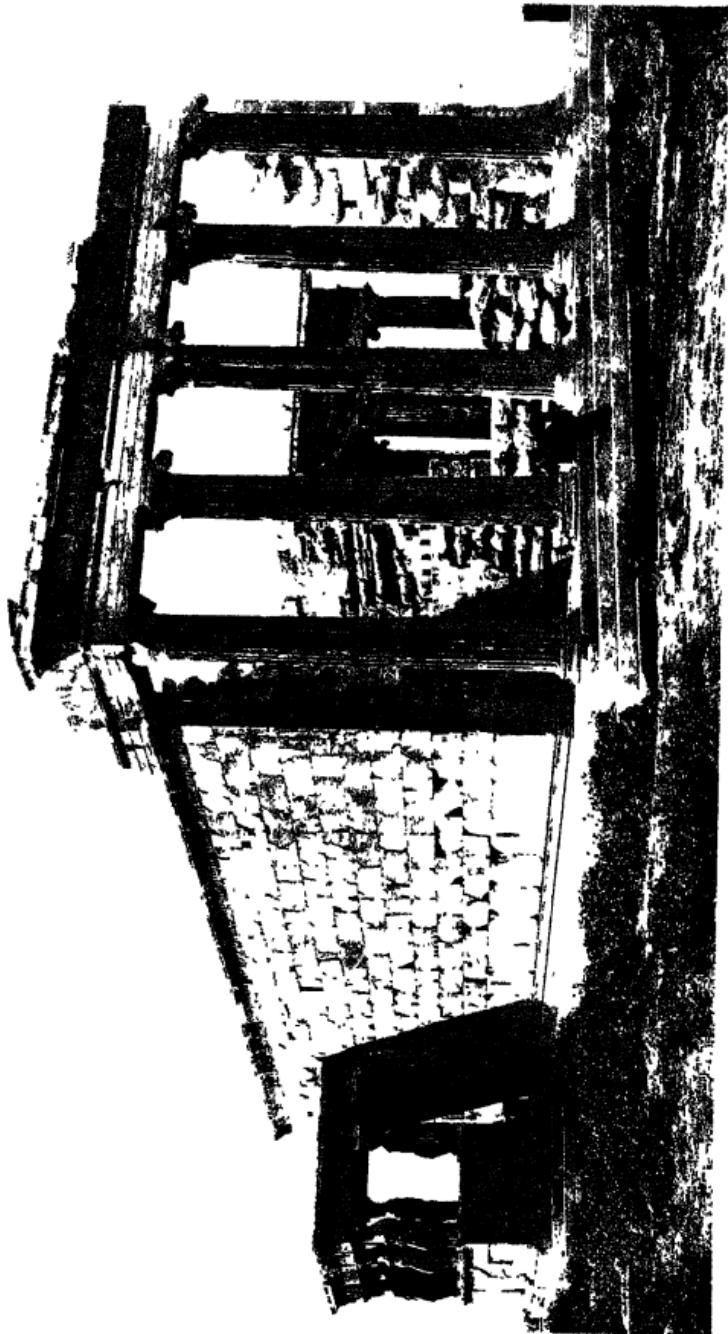
\* This was subsequently enlarged to occupy the entire area of the western chamber, but the workmanship is evidently of mediaeval date.

sagging curve which would help to obviate, in a more successful way than that attempted at Bassae, the drooping effect which, in the corner capitals at least, might otherwise have been produced in the upper fillets ; above the egg and tongue, moreover, is a torus moulding richly carved with the guilloche, and, underneath the capital, a band or necking carved with the anthemion (as at Naucratis, Samos, and Locri). A similar enriched band decorates the antae (Plate XXXVIII) and is carried round the entire building, together with the profile of the anta capitals themselves, which differ from Asiatic examples in forming merely a richly decorated series of horizontal mouldings. The capitals of the corner columns of both porticoes have, as usual, the volutes turned anglewise on the diagonal, so as to face both ways ; the internal angles within the porticoes had therefore two volutes intersecting each other at right angles (*cf.* Fig. 47), a somewhat unsatisfactory solution of the problem. Though the architrave retains the three fascias of the Asiatic Ionic style, the dentils of the cornice which form such prominent features in the Ionic temples of Asia Minor are here omitted altogether and replaced by a carved cyma. The entablature of the south portico or Caryatid tribune (Plate XLI), on the other hand, omits the frieze, probably with the idea of diminishing the load carried on the heads of the human figures ; but in compensation the Asiatic dentils reappear in the cornice, though much reduced in projection and becoming merely an intermittent moulding, thus losing all structural significance. These Caryatid figures perhaps represent the "arrephoroi" alluded to by Pausanias as "the maidens who bear on their heads what the priestess of Athena gives them to carry." The figures vary in the lines of the folds of their dress and in their pose : the three on the left hand rest on the right leg, and *vice versa*, the vertical folds of the dress (which suggest the fluting of a column) being always on the side of the supporting limb ; and they form the most satisfactory types that were ever evolved from their archaic predecessors at Delphi.

Among other details of the temple must be noted the entrance to the shrine of Erechtheus, the magnificent central doorway of the north portico (Plate XLII), which may be regarded as an example of the finest Greek design, though it has been restored in Roman times and relined in the Byzantine period.\* Equally rich are the remains of two windows which flanked on either side the doorway

\* See R. S. Weir, *Journal of Hellenic Studies*, vol. XII.

PLATE XLIV



THE ERECHTHEUM, FROM THE SOUTH-EAST.



in the wall behind the east portico, leading to the shrine of Athena Polias (Fig. 49); the mouldings of the cornice and architrave of the windows were richly carved with the egg and tongue, the Lesbian leaf and dart, and the double guilloche, and there were consoles on either side as in the north doorway.\* The ceilings of the east, north, and south porticos were richly coffered in marble, and those over the inner rooms showed, according to inscriptions, a lighter coffered design executed in wood. Though the temple was thus minutely carried out even to the last details of woodwork, carving, and painting, yet certain details, such as the rosettes on the architrave of the Caryatid porch, escaped attention. This was perhaps due to the vicissitudes in its history: for although the Erechtheum was probably commenced as early as 421 B.C., the works were apparently stopped and not resumed till 409 B.C.

A very unusual type of temple was the Hall of the Mysteries at Eleusis, forming the most conspicuous feature in the conjectural restoration by Gandy-Deering (Plate LVIII); it was designed just before 430 B.C. by Ictinus, the architect of the Parthenon, but, beyond the scheme of its plan, no architectural remains of this period have been found. The foundations of the present ruins, excavated after 1882 by the Greek Archaeological Society, nearly four times the size of the archaic temple on the same site, belong to the work set out by Ictinus, the hall being approximately 170 feet square internally (Fig. 50). As then arranged there were four rows of

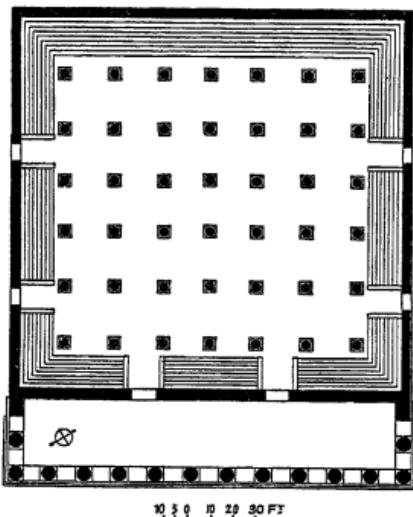


FIG. 50.—HALL OF THE MYSTERIES AT ELEUSIS.

\* See G. P. Stevens, *American Journal of Archaeology*, vol. X. This east wall had been destroyed to make way for the apse of the Byzantine church established in the temple, and apparently the materials were utilised in the foundation of the apse.

columns running parallel to the main south façade, with five columns in each row, the present arrangement with six rows each of seven columns being due to a Roman renovation of the interior; the central rectangle probably formed an opaion, through which light was admitted by means of a clerestory above the roof, originally constructed, according to Plutarch, by a certain architect named Xenocles. There were two entrance doorways in the front, and also two on the right and on the left sides; and the hall is lined on all sides with steps or seats for the devotees, cut wherever possible in the solid rock. It was originally intended by Ictinus that a peristyle should be carried externally round

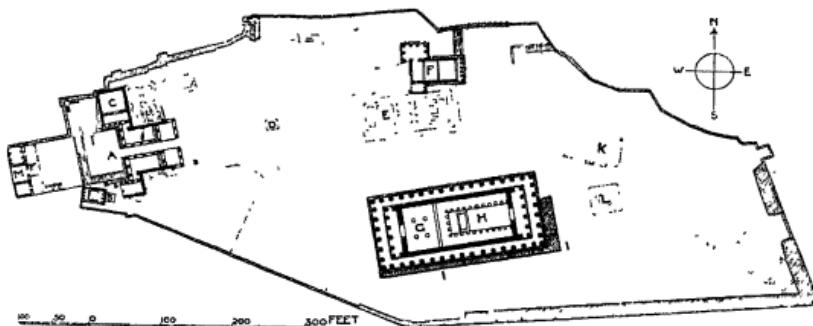


FIG. 51.—PLAN OF THE ACROPOLIS AT ATHENS.

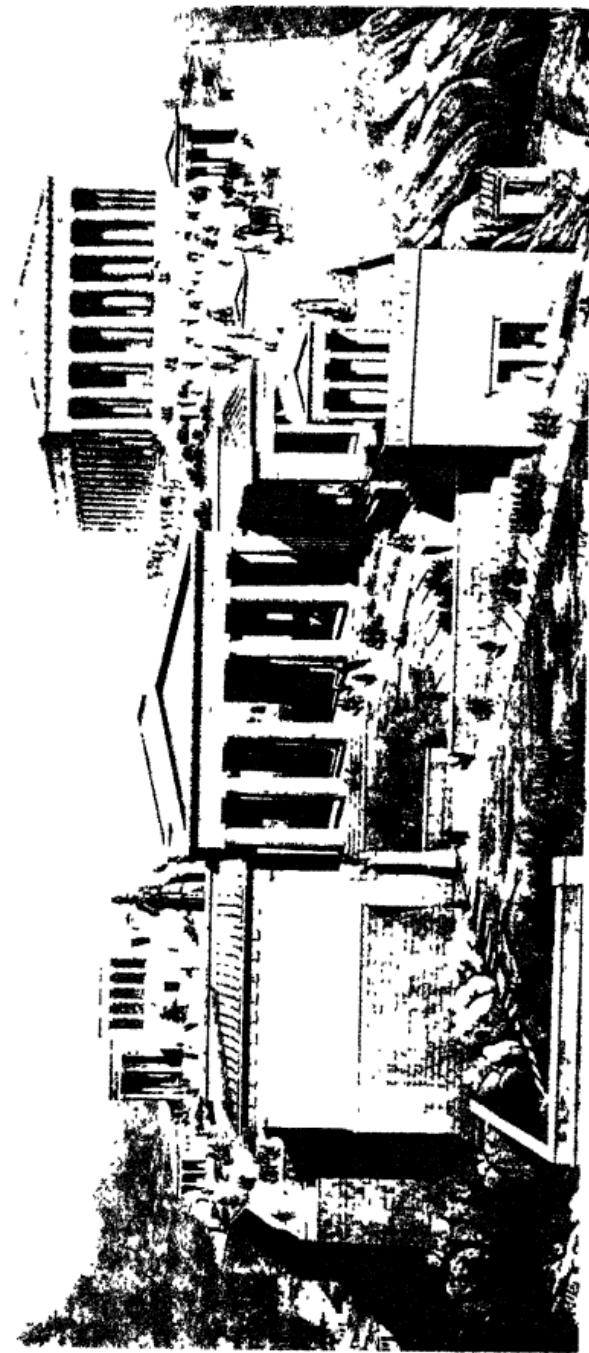
- |                                       |  |
|---------------------------------------|--|
| A. The Propylaea                      | G. The Parthenon   Parthenon or Treasury |
| B. Temple of Nike Apterous            | H. Cellae Hecatompedon Naos              |
| C. Pinacotheca                        | I.I. Substructure of Older Parthenon     |
| D. Site of Statue of Athena Promachos | K. Altar of Athena                       |
| E. The Old Temple of Athena           | L. Temple of Roma and Augustus           |
| F. The Erechtheum                     | M. Beulé Gate                            |

three sides, the fourth being backed against the cliff; but this was abandoned, and only on the south front was it eventually revived in a modified form, the dodecastyle portico added by Philon.

\* \* \* \* \*

Leaving the subject of temples, we may glance first at the scheme of the Acropolis as a whole, as it existed in the Periclean period (Fig. 51). At the middle of the south and north edges of the long plateau, now terraced up with massive retaining walls in order to form a series of horizontal platforms connected with ramps and steps, stood the Parthenon and the Erechtheum, the former covering the site of the Older Parthenon, while the latter lay just to the

PLATE XLV.



THE ACROPOLIS FROM THE WEST (RESTORED BY BOHN).



north of its predecessor, the Old Temple of Athena, which was apparently demolished to form a level platform. Farther west, in the centre of the area between the two temples and the Propylaea, stood the colossal bronze statue of Athena Promachos. And at the extreme west end "is the single access to the Acropolis; no other is practicable," says Pausanias, "as the hill rises abruptly on all sides and is fortified with a strong wall." The approach seems at this epoch to have been an unsymmetrical winding path, probably passing by the foot of the bastion carrying the temple of Athena Nike (Plate XLV); the whole was modified to its present form in Roman times, as will be noted later.

At the head of the ascent stood the Propylaea (Fig. 51 A; Plates I and XLV), a name given to the whole pile constructed in 437—432 B.C. from the designs of Mnesicles, including the central building and, as originally designed, four wings (Fig. 52). The central building contained Doric hexastyle porticoes facing west and east, the former resting on a platform of four steps while the latter, owing to the rise in the ground, is not only at a higher level but also stands merely on a simple stylobate (Plate XLVI). The Doric columns are more than 5 feet in diameter and are nearly 29 feet high on the west, about a foot lower on the east. The central intercolumniation was much wider than the others, and in its frieze occupied the width of three metopes, the purpose being to provide easier access for the procession and the beasts of sacrifice (Plates XLII, XLV).

The cross wall, pierced with five doorways which correspond approximately in axes and in widths with the varying intercolumniations of the façades, was placed nearer the inner or east façade, so that the inner vestibule, about a third of the total depth of the building, could be spanned by a marble ceiling without intermediate supports. Hence the depth of the vestibule behind the west façade was about two-thirds of the total depth of the building, and was about three-

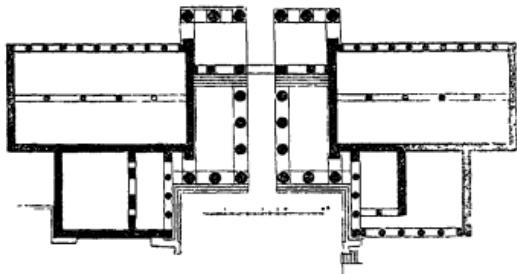


FIG. 52.—THE PROPYLAEA OF THE ACROPOLIS.  
(Restored by Dörpfeld.)

quarters of its width ; the marble ceiling\* in this case was carried by a row of three Ionic columns (33 feet 9 inches in height) on each side of the central roadway. The slender character of the Ionic order enabled its height to exceed that of the Doric columns, whilst allowing of a far smaller diameter of the base (Plate XLVI), considerations which prevailed, as we have seen, also in the Parthenon ; the section through this vestibule affords a good example of the proper relation of Doric and Ionic architraves and ceiling. On the left hand side of the main west front is a small building called the Pinacotheca or picture gallery (Fig. 51, C), from the fact that it was filled with paintings which were described by Pausanias and others ; it forms a lateral wing to the Propylaea, from which it is entered through a portico of three Doric columns in-antis, while the chamber behind is lighted by windows on either side of the doorway (Plate XLVI). On the south side the wing which should have corresponded to the Pinacotheca stops short at the old Pelasgic wall terracing the site which evidently formed part of the sanctuary of Artemis Brauronia ; apparently the construction was opposed by the priests of that goddess. For a similar reason the projection of this southern wing westwards was curtailed owing to the site being occupied by the temple of Athena Nike. The curtailment of Mnesicles's design is evident also on the east side, where the antae at the northeast and southeast corners of the central building, and also a stump of wall at the northeast corner of the Pinacotheca, prove that it was the intention of the architect to add further structures, which would virtually have faced the whole west part of the Acropolis (Fig. 52).†

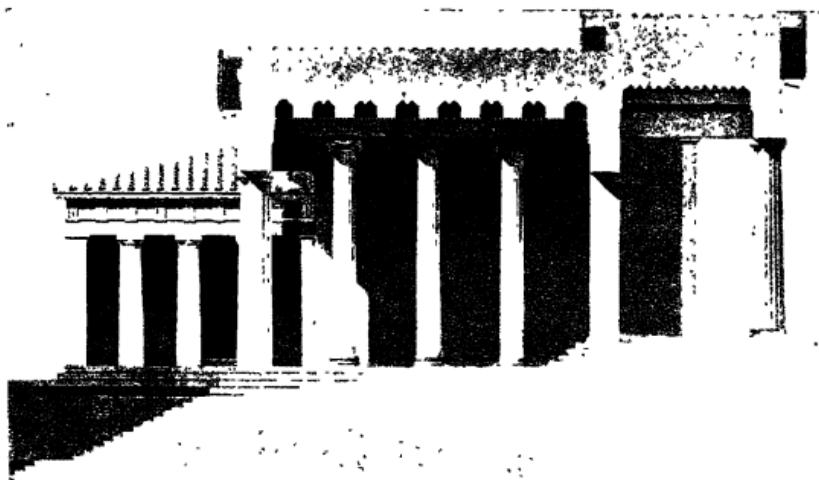
It was during the fifth century that the art of theatre design originated, in the structure erected against the south slope of the Acropolis. At the beginning, the theatre was designed for the performance of choral dances pertaining to the worship of Dionysus, but they soon obtained a much greater importance and popularity, and were used for a variety of purposes not always necessarily dramatic. The earliest of these theatres was that of Dionysus at

\* This seems to have attracted Pausanias's attention, as he says : "The Propylaea has a roof of white marble, and the size and beauty of the stones were remarkable even when I saw it."

† Dörpfeld's restoration of these curtailed east halls and of the southwest wing, as shown in Fig. 52, has been considerably modified by recent American studies of the building, soon to be published ; for instance, the two rows of nine small columns facing eastward, and that of four small columns facing westward, should each be replaced by solid walls.

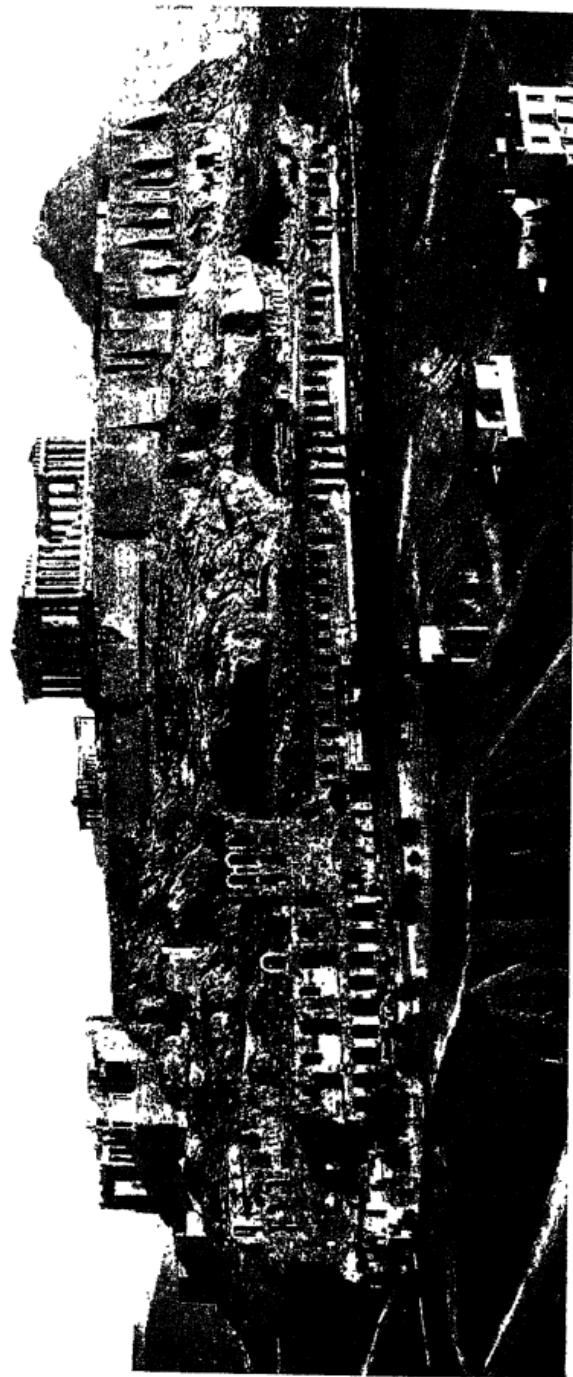


THE NORTH WING (PINACOTHECA) OF THE PROPYLAEA.



SECTION OF THE PROPYLAEA AT ATHENS  
(RESTORED BY ULLMANN).

PLATE XLVII.



THE ACROPOLIS AT ATHENS FROM THE SOUTH.

Athens, where have been found traces of the original orchestra, a perfect circle 87 feet in diameter, dating back to 499 B.C. The orchestra was the scene of the dance, which was conducted round the altar of Dionysus in the centre. There was at first no scene building, and the seating space was the bare hillside. A little later the hillside was slightly excavated to give the auditorium a steeper slope, the orchestra circle being at the same time moved closer to the Acropolis, thus saving the expense of raising a foundation for the upper seats ; and, while the beautiful prospect in itself at first served as the scenery, a special scene building of wood was soon introduced at the back of the orchestra. This scene building may first have been required for acoustic reasons, but it was soon employed also for displaying artificial scenery. The theatre was at this unpretentious stage of its development when the great plays were produced in it during the age of Pericles.

Adjoining the theatre was constructed by Pericles a new form of building, the odeum or music hall. This was mentioned by Plutarch, who says that "the odeum, built under the supervision of Pericles, has many seats and pillars within ; the roof was made slanting and converging to one point, and they say that it was after the model and as an imitation of the Persian king's tent." Vitruvius also mentions "the odeum as you go out at the left side of the theatre," and says that "it was set out with stone columns and roofed with the yards and masts of ships captured from the Persians." It was restored after the sack of Athens by Sulla, and (as stated by Pausanias) after the original design. Its position, near the theatre, suggests that it was used for rehearsals and musical contests, the latter introduced by Pericles himself in 446 B.C. From ancient descriptions it was thought that, when found, the building would prove to be circular ; but the foundations recently discovered by the Greek Archaeological Society show that it was a perfect square, with the roof supported by a forest of columns in the manner of the Hall of the Mysteries at Eleusis.

\*       \*       \*       \*

In this chapter we have considered together the buildings of the two distinct orders, the Doric temples at Olympia and Bassae, at Rhamnus and Sunium, the Argive Heraeum, and the Parthenon, Propylaea, and Theseum, at Athens, as well as the Ionic Erechtheum and temple of Athena Nike and that on the Ilissus. For

these two distinct types of Greek work found their culmination and coalesced in the age of Pericles. All of those in Athens, at least, could not by any possibility have been designed elsewhere ; for on each of them there are marks of a distinctive Attic style. It is to be noticed that the familiarity with the Ionic proportions led the Attic artists to reject the ponderous proportions of Doric columns, and to adopt a mean which inclines more closely to the Ionic than any pre-existing examples. Yet the Parthenon and the Theseum, in spite of this and other details which have been noticed, such as their continuous sculptured friezes and many of their ornaments, are substantially Doric. Of the buildings we have examined, the Propylaea and the temple at Bassae combine most freely the Ionic-Doric principles, and most appropriately, each finding its true place. But even in the purely Ionic buildings, such as the Erechtheum, the Doric influence appears in a few details, such as the insertion of a frieze in the entablature, and the projecting antae at the ends of the walls. All of them thus in a measure illustrate the coalescence of types which is characteristic of Athenian work, as it was to some extent typical of the people themselves.

## CHAPTER VI

### THE BEGINNING OF THE DECADENCE

THE supremacy of Athens in the Aegean portion of the Greek world was but short lived; for a succession of long wars, the Peloponnesian (431-404 B.C.) and the Corinthian (395-387 B.C.), drained all her energies and deprived her of her Greek leadership. Thus the fall of Athens in 404 B.C. may justly be taken as the beginning of a new epoch; humiliated and impoverished, she was in no condition to maintain the high artistic excellence which she had reached under Pericles. Less cultivated states became dominant powers, such as Sparta (404-371 B.C.) and Thebes (371-362 B.C.); then followed a period of vain struggles against the gradual encroachments by a people hitherto considered foreign, the Macedonians, whose recognised ascendancy in Greek affairs may be dated from the battle of Chaeronea in 338 B.C. It is but natural that these rapid changes of political fortune should have found their echo in the absence of great architectural undertakings. During this century the architecture of the mainland is to be traced only in comparatively minor structures.

In the colonies of the west, conditions were even worse; we find practically no work which can be attributed to the fourth century. The catastrophe of the Carthaginian invasion, the destruction of Selinus and Himera in 409 B.C., of Acragas in 406, and of Gela and Camarina in 405 B.C., seem to have been followed by a period of utter stagnation. In 405 B.C. was drawn up a treaty between Carthage and the new tyrant of Syracuse, Dionysius, according to which Carthage was recognised as dominant in the western part of the island, and Syracuse remained the only important Greek state.

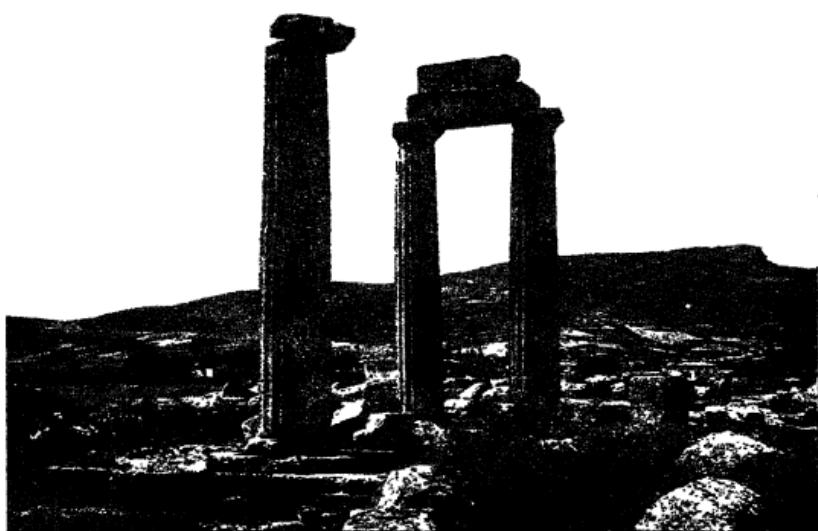
Far otherwise was it in Asia Minor, where the Ionic cities had played, as we observed, very little part in the artistic development of the fifth century. They had fallen a prey to the Persians in

494 B.C., and were kept in subjection until the formation of the Delian Confederacy in 478 B.C. Thenceforward until 404 B.C. they were overshadowed by Athens, to whom they were contributory; and the downfall of Athens merely gave them a new master, Sparta. It was not until the Peace of Antalcidas in 387 B.C. that the mainland powers withdrew from Asia Minor, leaving the Ionic cities in a state of comparative quiet under Persian sovereignty. The luxurious conditions that developed under the Persian satraps find their analogy only in the reigns of the Lydian kings and local tyrants of the archaic period, and they brought about in Asia Minor a revival of architectural grandeur, in which the qualities of the magnificent and ornate are conspicuous; in fact, the outstanding feature of this fourth century is the so-called Ionic Renaissance. The arrival of Alexander the Great in 334 B.C. found many great projects under way; and the new conqueror was quick to seize the opportunity and to make the completion of the great Ionic temples a personal issue. There was no marked break in the development until after the partition of Alexander's empire by his generals.

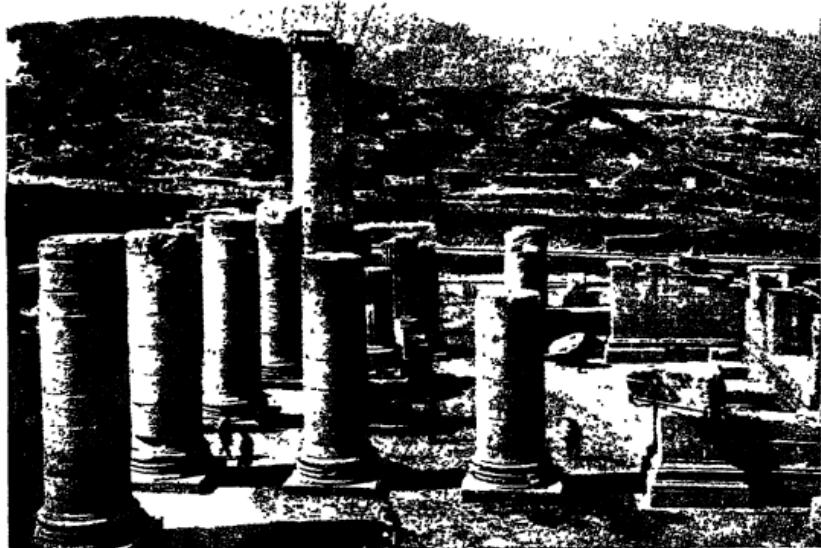
Throughout the Greek world, however, the fourth century is characterised by certain general tendencies. In the first place, it marked the beginning of a decline from aesthetic perfection. The religious aspect, the chief inspiration of any style of art, had reached its culmination in the Periclean temples, and now began to be outweighed by human elements, a stage of development which indicates that we have passed the crest of the wave. From the temple, which had previously represented almost the sole aim of architecture, attention was diverted to a great variety of structures, almost as many types of buildings as we erect at the present day, corresponding to the varied activities of a more complex civilisation. And even in religious architecture the same striving for diversity and innovation is manifest in the increase of ornament, at the expense of strength and dignity.

\* \* \* \* \*

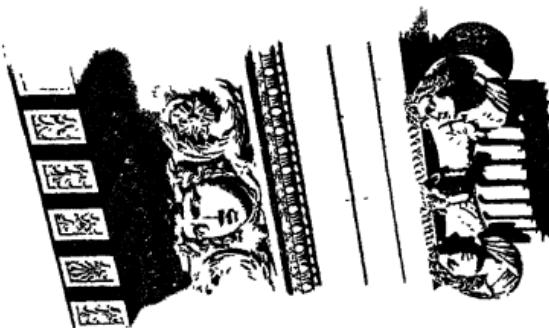
The great temple building epoch on the Greek mainland had passed with the end of the fifth century; the Doric order was incapable of being further perfected, so that architects began to seek variety by introducing additional ornament or combining it with other orders. Typical of the period was the temple of Athena



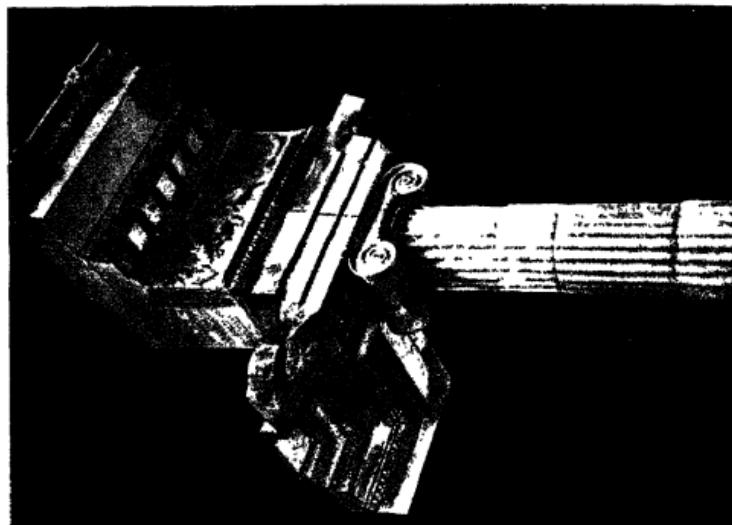
THE TEMPLE OF ZEUS AT NEMEA.



THE TEMPLE OF ARTEMIS-CYBELE AT SARDIS.



CAPITAL AND ENTABLATURE OF  
THE TEMPLE OF APOLLO  
AT DIDYMA  
(RESTORED BY PONTREMOLI).



CAPITAL AND ENTABLATURE OF THE  
MAUSOLEUM AT HALICARNASSUS  
(BRITISH MUSEUM).



CAPITAL AND ENTABLATURE OF  
THE TEMPLE OF ATHENA  
AT PRIENE  
(BERLIN MUSEUM).

Alea at Tegea, built from the designs of the sculptor Scopas, and described by Pausanias in the following terms : "The first row of columns is Doric, and the next Corinthian ; without\* the temple, too, stand columns of the Ionic order." This is, incidentally, Pausanias's only reference to the Corinthian order ; he regarded the temple as the most beautiful of all those in the Peloponnesus, and in size it was second only to that at Olympia. The researches made by Dörpfeld, and subsequently by the French, proved that the peristyle was Doric, and many of the drums and capitals were found. The pronaos and opisthodomus likewise were Doric ; but the cella was lined with semi-detached columns imitating the arrangement at Bassae, though the capitals were Corinthian rather than Ionic. It is probable that the Ionic columns were votive monuments on separate foundations flanking the approach to the temple. This combination of the orders was characteristic also of other mainland temples of the fourth century, such as those of Apollo at Delphi (Plate XXV), of the Mother of the Gods at Olympia (Plate XXIV M), of Zeus at Stratos, and of Zeus at Nemea, the latter distinguished also by the extremely slender Doric columns of its peristyle (Plate XLVIII). Another characteristic example was the temple of Asclepius at Epidaurus, purely Doric but remarkable on account of the omission of the opisthodomus, a fact which holds true also of Nemea. All these temples are hexastyle, the number of flank columns varying from eleven to fifteen.

Contrasted with this comparative inactivity on the Greek mainland is the long list of Ionic temples of this period in Asia Minor. One of the most typical, though at the same time least pretentious, of these is the temple of Athena at Priene, near Miletus, a small but beautiful example built at about 340 b.c. from the designs of Pythius, who wrote a book about it. It was hexastyle, with eleven columns on the flanks, and is of the ordinary plan, with pronaos, cella, and opisthodomus (Fig. 53). The bases of the columns of the peristyle rested on square plinths, features never found in the earlier Greek temples (except at Ephesus), as they would have interfered with the free passage round. One or two of the capitals of the peristyle columns and the capital of one of the antae are in the British Museum. The anta capitals, as in most Asiatic examples, differ on front and sides, the front having superposed carved mouldings while the sides are decorated with

\* The Greek text says "within the temple," probably by error.

rinceaux and foliage in relief. The entablature at Priene still adheres to the traditional Asiatic type, omitting the frieze, but with very heavy dentils in the cornice (Plate XLIX).

Though not the largest, the most important temple in Asia Minor was the great temple of Artemis (Diana) at Ephesus. The archaic temple of the sixth century is stated to have been burnt in 356 B.C., and was rebuilt immediately afterwards at a level 9 feet higher,

in still greater splendour, though with a plan identical with that of its predecessor, and borrowing apparently from the earlier temple the idea of the sculptured columns, which are found only at Ephesus. It was probably the beauty of these sculptured decorations which caused this temple to be classed among the seven wonders of the ancient world. The site of the temple was discovered and excavated by J. T. Wood in 1869-1874, and the remains were brought over and placed in the British Museum. Wood found two of the columns of the peristyle of the north and south flanks *in situ*, about 100 feet run of the lowest step of the platform on the north side, and the foundations of a great portion of the rest of the structure, which, in combination with Pliny's statements, shows

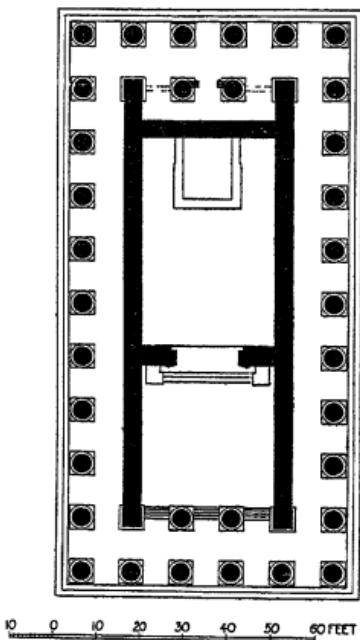
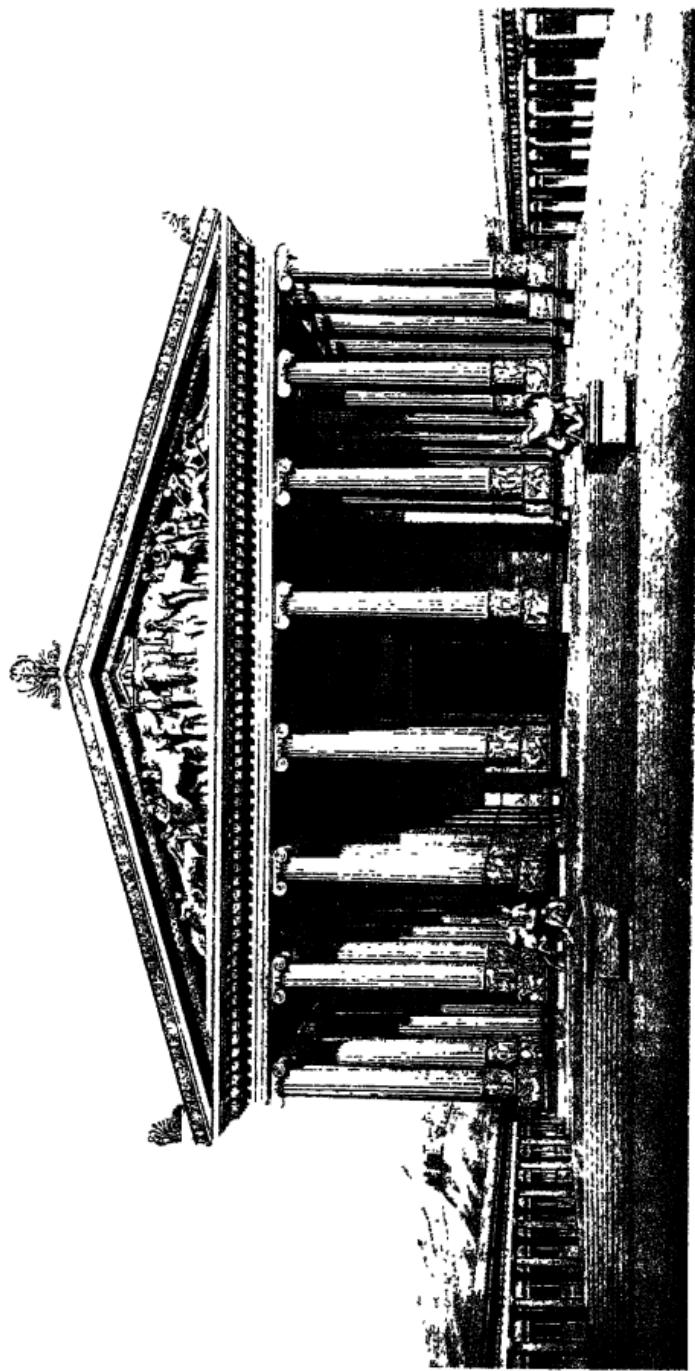


FIG. 53.—THE TEMPLE OF ATHENA  
AT PRIENE.

that the temple was octastyle and dipteral, with a pronao, cella, and opisthodomus (Fig. 54). The chief problem to be settled is the arrangement of the hundred and twenty-seven (probably really one hundred and seventeen) columns mentioned by Pliny, and particularly of the thirty-six of these that were sculptured. The conjectural restoration by Murray, based on a long study of the sculptured drums (Plate L) and square sculptured pedestals, which form so important a part of the remains in the British Museum, has long been accepted by both English

PLATE L.



WEST FRONT OF THE LATER TEMPLE OF ARTEMIS AT EPHESUS (RESTORED BY HENDERSON).



and foreign archaeologists.\* According to this, there were only one hundred columns on the exterior, both façades being octastyle and the flanks having twenty columns, the whole being dipteral; among the hundred columns are counted the two columns in-antis both in the pronao and in the opisthodomus. But Fergusson had pointed out that there were probably nine columns on the rear façade, and Lethaby has shown that there were probably three rows of columns across the main façade; with these modifications, the number of peristyle columns is increased by ten, while the opisthodomus was probably tristyle rather than distyle in-antis, and the pronao was really much deeper than Murray had shown it, not merely with one but rather with four pairs of columns; the total number thus rises to one hundred and seventeen.† The circumstances are similar with regard to the sculptured columns. Assuming that the level of the platform on which the peristyle rested would coincide with the tops of the square pedestals, Murray placed eight of the latter on each façade, with only four steps below them, these four steps being carried round the entire structure; an additional flight

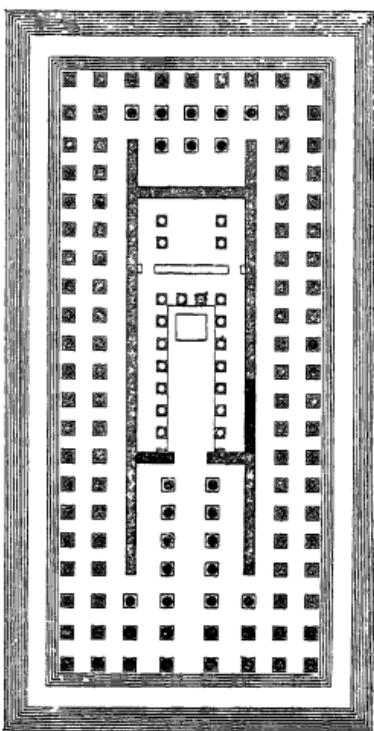


FIG. 54.—THE LATER TEMPLE OF ARTEMIS AT EPHESUS. (Restored by Fergusson, Lethaby and Dinsmoor.)

\* Murray's restoration was illustrated in the second edition of this work.

† In the work published by the British Museum in 1908, dealing with the archaic temple (which had the same plan), the total number of one hundred and twenty-seven given by Pliny was obtained by the subterfuge of counting the internal columns of the cella, which seems out of the question. It is preferable to adopt the recommendations of Fergusson and Lethaby, and also to assume that Pliny (or his mediaeval copyists) wrote by mistake CXXVII for CXVII.

of nine steps, required in order to reach the level of the stylobate, was placed between the first and second rows of columns at the east and west ends, but was not continued along the flanks, where the columns rest rather on a solid podium in the Etruscan manner. The thirty-six sculptured columns were then placed with sixteen on these square pedestals,\* sixteen resting directly on the pavement in the second row on each façade, and four in the pronaos and opisthodomus. But it is preferable to carry the steps uniformly round all four sides of the temple (Plate L)† and to raise the square sculptured pedestals and place them on the same level as the circular sculptured drums, that is, on the stylobate, so that the pedestals as well as the drums must be counted among the thirty-six *columnae caelatae* cited by Pliny. Thus the sculptured drums might have been only sixteen in number, being confined to the first two rows on the main west façade; these, however, must have been placed on regular Ionic bases and not directly on the pavement. And the square sculptured pedestals would have been used as suggested by H. C. Butler on the analogy of the temple at Sardis, only in connection with the pronaos and opisthodomus, where they would have supported smaller Ionic columns with their bases at a higher level; the four columns before the pronaos and the five before the opisthodomus (forming in each case a sort of prostyle portico), as well as the eight columns between the walls of the pronaos and the three columns in-antis in the opisthodomus, a total of twenty, would have been so treated. The architects of this temple were Paeonius and Demetrius, both of Ephesus.

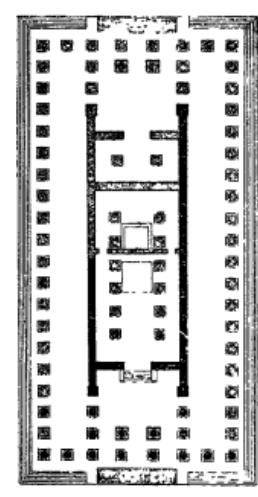


FIG. 55.—THE TEMPLE OF ARTEMIS CYBELE AT SARDIS. (After the restoration by Butler.)

Another colossal temple dedicated to Artemis in this neighbourhood was that at Sardis, also known as the temple of Cybele,

\* The raising of the *Columnae caelatae* on the square pedestals was suggested many years ago by Fergusson.

† This restoration is shown as a substitute for that of Murray; but it is to be understood that the sculptured drums and pedestals should not be superposed as here indicated.

which was completely excavated by H. C. Butler in 1910-1914, representative members of the columns being placed in the Metropolitan Museum in New York. Again octastyle, with twenty columns on the flanks, the scheme was however not dipteral but pseudo-dipteral, at least in part; for on the flanks the interval between the columns and the cella wall is equal to two inter-columniations, as if the inner row of columns had there been omitted (Fig. 55). On the façades there is an inner row, forming a prostyle arrangement before the pronaos and opisthodomus, and coming directly behind the outer rows; it is among these inner columns that we find the square pedestals, left in block form and clearly intended to be sculptured, supporting Ionic columns of a smaller size, which form the best analogies for the treatment at Ephesus (Plate XLVIII). The Ionic capitals of the exterior were specially admired by Cockerell; some of these are wonderful works of the fourth century, while others are coarse imitations made during the Roman repairs in the first century A.D.

Paeonius of Ephesus, one of the architects of the temple of Artemis in that city, was employed together with Daphnis of Miletus to build the temple of Apollo at Didyma (Branchidae) near Miletus; probably the work was undertaken at about 334 B.C., though Strabo seems to imply that it was rebuilt shortly after the destruction of the archaic temple by Xerxes, a statement which does not agree with the character of the remains. It was one of the largest temples in Asia Minor, so large that, according to Strabo,\* they were unable to roof it; in other words, the cella was hypaethral, one of the few examples about which there is no doubt, though, curiously enough, Vitruvius does not refer to it. The temple was dipteral, and unique in that the façades were decastyle; on the flanks were twenty-one columns, so that including the twelve columns in the deep pronaos the total number was one hundred and twenty (Fig. 56). The temple was remarkable not only for its size but also for its design. Under the columns, as at Priene and Ephesus, were employed square plinths, notwithstanding the great projections which such plinths had diagonally when the lower diameter of the column was as great as 6 feet 6

\* Strabo says, "In after-times the inhabitants of Miletus built a temple which is the largest of all, but which, on account of its vastness, remains without a roof, and there now exist, inside and outside, precious groves of laurel bushes." Its dimensions were in reality exceeded by those of the archaic temple at Samos.

inches. In the bases of the principal façade there is considerable diversity of design, the ten bases being arranged in pairs symmetrical with respect to the central axis; only the outermost bases are of the normal form, the first and the third from the centre substituting a round plinth for the upper torus, while the second and fourth from the centre substitute a plinth for the disk with the two scotias.

But the first and third from the centre are further differentiated by having, in the latter case, the Attic profile with a scotia and a lower torus instead of the disk with two scotias, below the round plinth; and the second and fourth are again differentiated in that the plinth which takes the place of the disk is round in the fourth and dodecagonal in the second, the latter having each face panelled and decorated within with conventional foliage, or in one case with a figure riding a seahorse (Plate LI). The round plinths and the torus mouldings are also richly carved, with maeanders, imbricated patterns of laurel leaves, and anthemion designs. In this exuberant richness of ornament at the bases of the columns the architects would seem to have attempted to rival, though

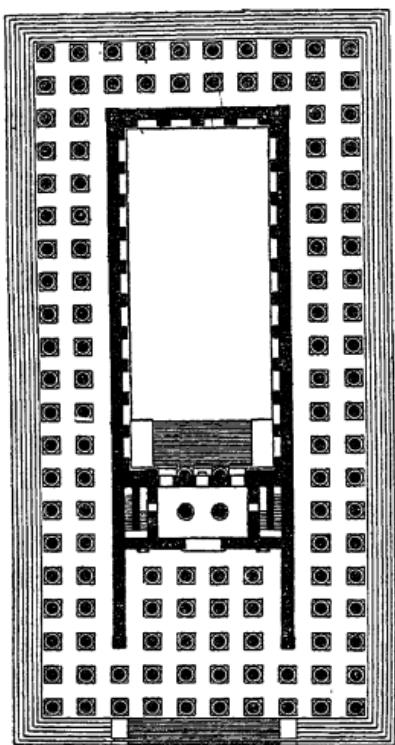
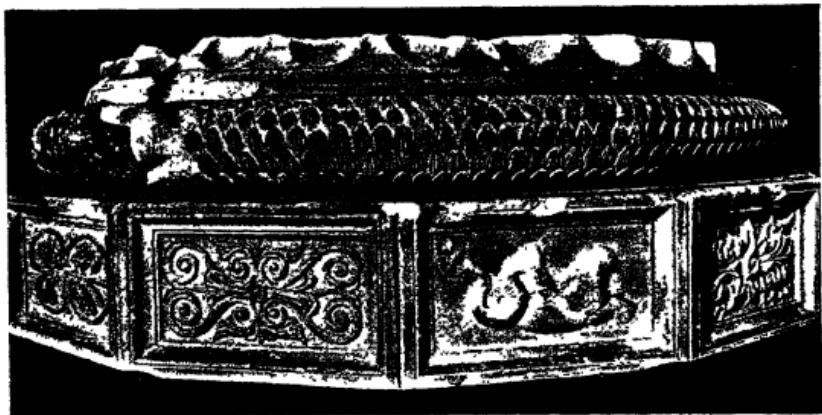


FIG. 56.—THE TEMPLE OF APOLLO  
AT DIDYMA.  
(Restored by Wiegand).

in another direction, the famous *columnae caelatae* of Ephesus. Analogous is the treatment of the capitals of the façade, with busts of Apollo and other divinities protruding from the volutes (Plate XLIX), and with a bull's head at the centre; the style of these heads bears so strong a resemblance to the sculptures of the Great Altar at Pergamum, built by Eumenes II (197-159 B.C.), as to suggest that the upper portions of the

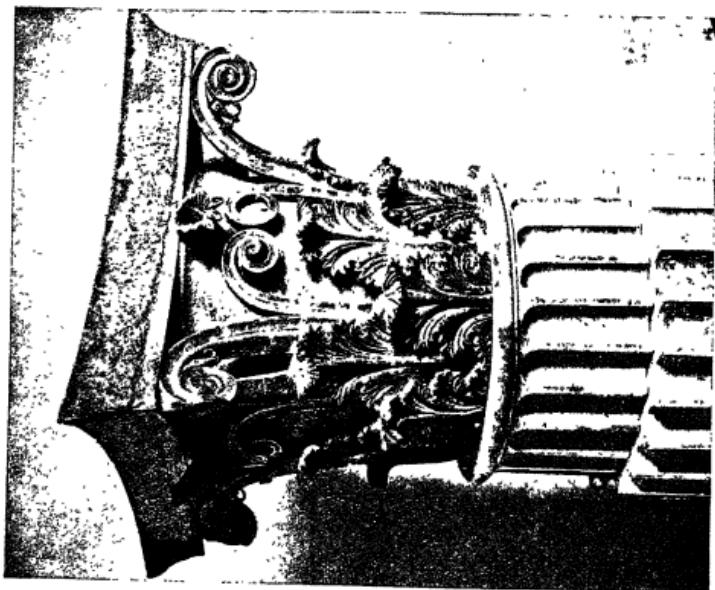


SCULPTURED DRUM FROM THE TEMPLE OF ARTEMIS  
AT EPHESUS (BRITISH MUSEUM).



SCULPTURED BASE FROM THE TEMPLE OF APOLLO  
AT DIDYMA (LOUVRE).

PLATE LII.



CORINTHIAN CAPITAL FROM THE THOLOS  
AT EPIDAURUS.

CORINTHIAN CAPITAL, TEMPLE OF ATHENA ALEA AT TEGEA (RESTORED).  
IONIC PLASTER CAPITAL, TEMPLE OF APOLLO AT DIDYMA (LOUVRE).

temple were being worked at this late epoch. This is in accord with the design of the ordinary Ionic capitals at Miletus, which seem considerably later than the capitals at Ephesus. In the entablature was inserted a frieze, sculptured with heads of Medusa; but by the time that the work was abandoned, early in the Roman imperial epoch, only the dentil course of the cornice had been laid, and the temple apparently permanently lacked its cornice and pediments.

The pronaos, as has been said, was very deep, and this was followed by an antechamber, sometimes thought to have been the Chresmographion where the oracles were delivered; on either side were stone staircases, carried between walls. Though a doorway opened from the pronaos into the antechamber, there was no direct communication between them; the threshold is about 6 feet high. Instead, small doorways on either side give access to descending tunnels which pass below the winding staircases mentioned above, and lead down to the cella, which really formed an open court with the pavement 14 feet below the stylobate of the peristyle. The walls of the cella were decorated with immense pilasters, 6 feet wide and 3 feet deep, resting upon a podium, so that their bases were at a level about 6 feet higher than those of the peristyle. Thus the height of the pilasters, including capital and base, was a little less than that of the peristyle columns. The capitals of the pilasters were very varied in design (Plate LII), though they are all of the cradle or sofa volute type which is so characteristic of work of this period in Asia Minor, the vertical volutes being connected across the bottom of the capital, and the enclosed panel decorated with foliage and animals; and between the capitals ran a band sculptured with griffins and lyres. There were nine pilasters on each side, and three at the west end, besides the responds at each corner. At the east end of the cella, separating three entrance doorways, were two semi-detached columns ranging with the pilasters, but with Corinthian capitals which are more fully developed than any other examples hitherto noted (Fig. 57); the spirals in the centre of each face, carrying the palmette, are, however, too small and leave too much of the surface of the bell uncovered. Access to these three doorways, and through them to the antechamber behind the pronaos, was gained only by means of a great flight of twenty-two steps, 53 feet in width, leading up from the great court. Near the back of the cella

are the foundations of a shrine, measuring 28 by 30 feet, which has recently been found to have had the form of a little prostyle tetrastyle Ionic temple; the anta capitals were decorated with a winged figure at the centre and a leaf ornament on either side. In this shrine was placed the bronze figure of Apollo, which was brought back by Seleucus from Ecbatana at about 295 B.C., after having been carried off by Xerxes.

Even more imposing in scale, though executed with the comparative simplicity of the Doric order, was the portico added at

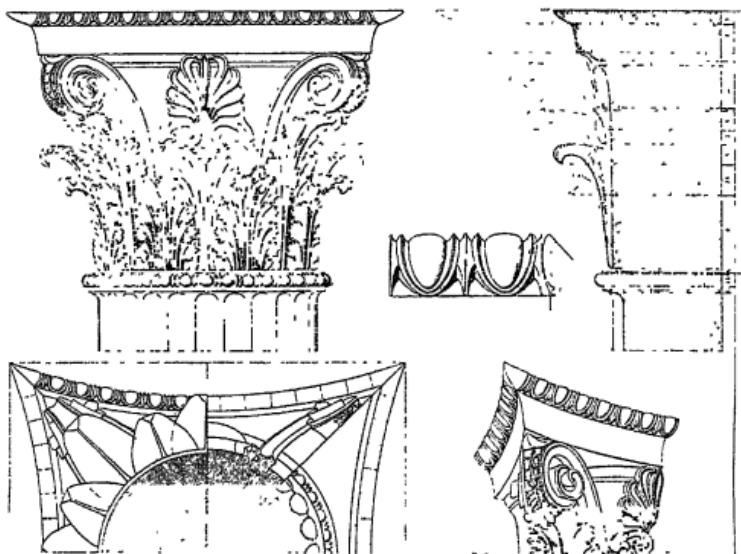


FIG. 57.—CAPITAL OF SEMI-COLUMN IN TEMPLE OF APOLLO AT DIDYMA.

this time to the south façade of the temple of unusual plan already mentioned, the Hall of the Mysteries at Eleusis (Fig. 50; Plate LVIII). The work was executed at about 320 B.C. by Philon of Eleusis, and assumed the form of a prostyle dodecastyle portico with two intercolumniations on either flank, the columns being 6 feet 6 inches in diameter, the whole frontispiece being crowned by an enormous pediment.

\* \* \* \* \*

Structures other than temples began in this period to assume more varied forms than had hitherto been the case. Particularly

notable, for instance, are the circular buildings, known as *tholoi*, erected within the precincts at Epidaurus, Delphi, and Olympia. The rotunda (*tholos*) at Epidaurus was the most beautiful and perhaps the earliest of these examples, and is stated by Pausanias to have been built by Polyclitus the Younger, who also designed the theatre. The building (Fig. 58) consists of a circular cella, with an external peristyle of twenty-six Doric columns, and inside a circle of fourteen Corinthian columns, standing free from the wall, with extremely beautiful capitals (Plate LII), showing a marked advance on that at Bassae, which preceded them by perhaps eighty years. Of the remains sufficient have been found to permit a conjectural restoration; but it is more probable that the roof was broken into two slopes, rising from the peristyle cornice to the wall and then from the wall in one conical slope to a central finial (*cf.* Fig. 59), instead of having a simple conical form, or the double slope with a central impluvium which is represented in some restorations. Next in date is the *tholos* at Delphi (Plate LIII.), designed by a certain Theodorus of Phocaea, with twenty Doric columns on the exterior (Plate LIV), and ten Corinthian columns, with variegated capitals directly imitated from that at Bassae, placed closely against the inner face of the cella wall, though not actually engaged. Last of all comes the circular building at Olympia, called the Philippeum, commenced by Philip in 339 B.C. and completed by Alexander; it consists of a circular cella surrounded by a peristyle of eighteen Ionic columns (Plate XXIV P.H.; Fig. 59). The walls of the interior were decorated with semi-detached columns of the Corinthian order, with an upper range above them reaching to the roof; the rafters of the roof were, according to Pausanias, held together at the top by a bronze poppy, which formed a central finial.

The best known example of the Greek Corinthian capital, though a most peculiar type,\* occurs in another circular building, the choragic monument of Lysicrates (Plate LV), situated in the Street of Tripods leading to the Dionysiac theatre at Athens. It was erected

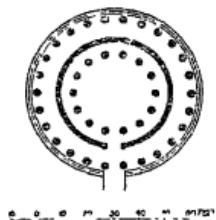


FIG. 58.  
THE THOLOS AT  
EPIDAURUS.

\* Its modern fame is due chiefly to its early publication by Stuart and Revett, at a time when no other pure Greek Corinthian capitals were known.

to support a tripod won during a choral victory in the theatre in 334 B.C. The monument consists of a high square podium, on which stands the circle of six columns; walls filling the intervals between the columns give them the appearance of being semi-detached, though in reality they are complete, the filling slabs being worked with a hollow to fit them. The capital (Plate LV) is higher than in other examples (of which we have already noted six: Bassae, Tegea, Epidaurus, Delphi, Olympia, and Miletus),

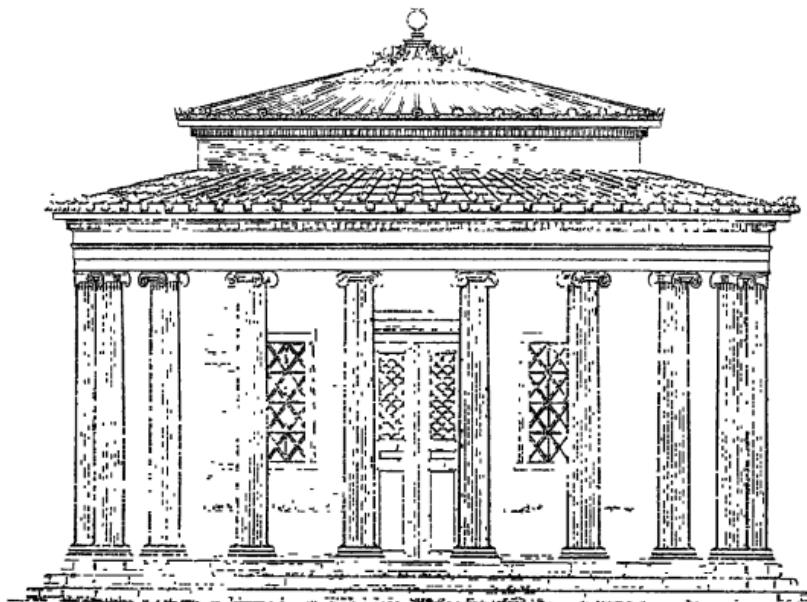
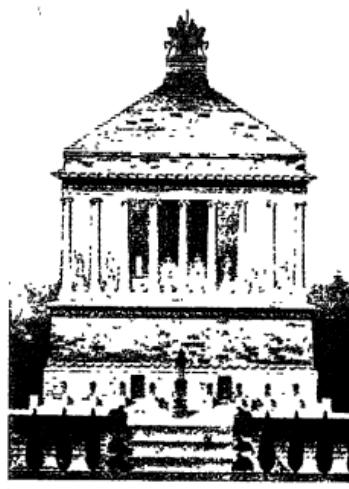
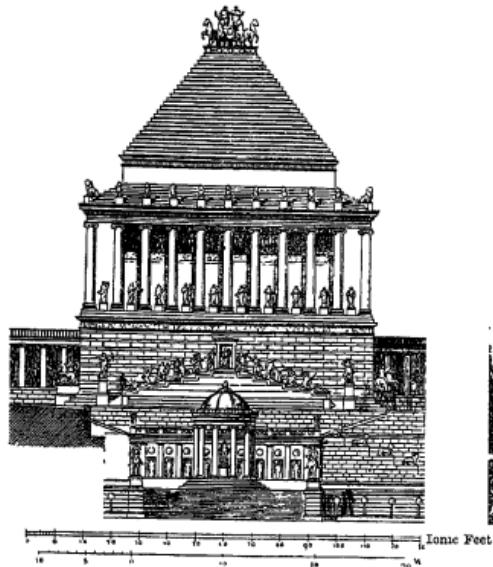
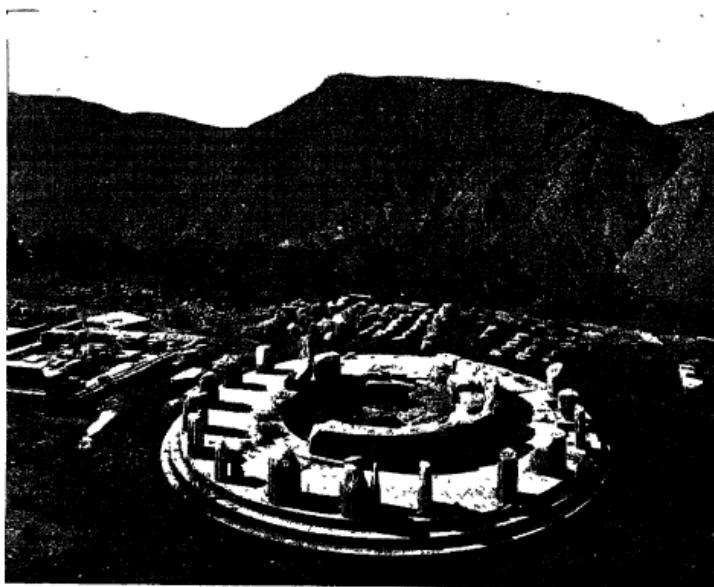


FIG. 59.—THE PHILIPPEUM AT OLYMPIA. (Restored by Adler.)

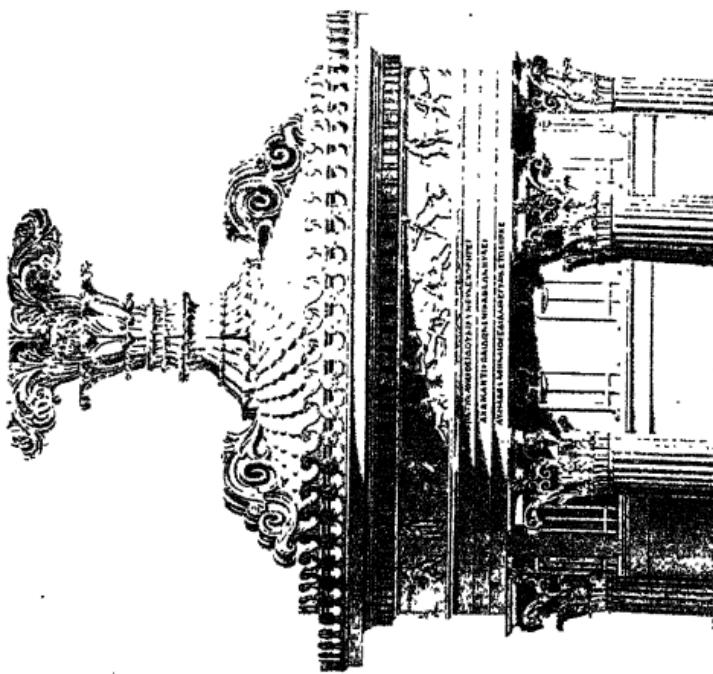
being one and a half diameters. The bell subdivides too easily into halves, the upper portion with the volutes not being sufficiently connected with the lower half with its two rows of leaves. The upper row of leaves of the acanthus shows between the leaves eight-petalled flowers or rosaces, which, according to Choisy, were copied from the heads of the pins which in a metallic prototype fastened the leaves to the bell or core of the capital. The lower row of leaves consists of the petals of some other plant, frequently found in Greek decorative sculpture alternating with the acanthus. There is no astragal between the capital and shaft,



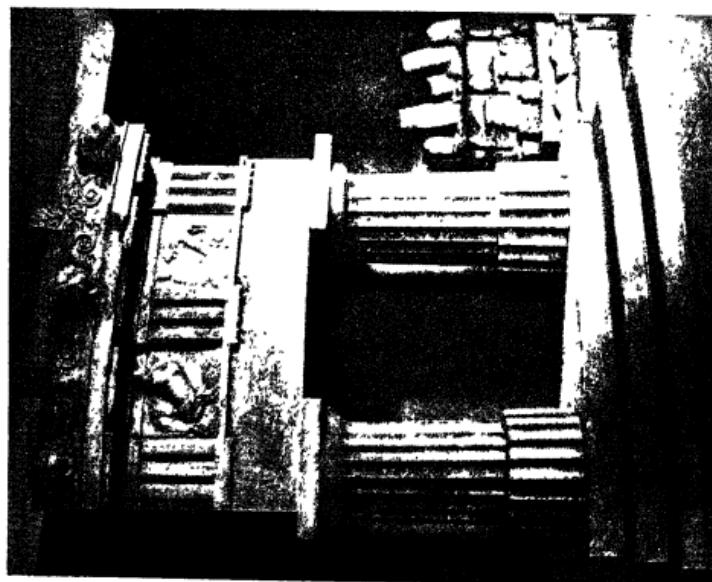
(b)



### THE THOLOS AT DELPHI.



DETAIL OF THE CHORAGIC MONUMENT OF LYSICRATES  
AT ATHENS (RESTORED BY STUART AND REVERT).



DETAIL OF THE EXTERNAL ORDER OF THE  
THOLOS AT DELPHI (DELPHI MUSEUM).

but merely a sinking which suggests that it was applied in bronze ; and below it the fluting of the shaft terminates in leaves, a treatment sometimes found in votive columns. The entablature repeats the mouldings of the Caryatid portico of the Erechtheum, but has in addition a sculptured frieze. As this was the first example of the Greek Corinthian order to be used externally, it was also the first occasion on which a complete entablature was required ; and, as the order had not been evolved from earlier constructional forms in timber in the same way as in the Doric and Ionic orders, it is apparent that the designer composed the entablature from elements drawn from different sources, the banded architrave and the frieze from the ordinary Ionic order as employed in Attica, and the cornice from the peculiar entablature of Asiatic type as employed in the Caryatid Porch of the Erechtheum. Thus was developed a form of entablature, a combination of the Attic and Asiatic Ionic types with the dentils much reduced in projection, which was destined to have great influence on the future history of the Corinthian, and even of the Ionic, style. The frieze, 10 inches high, is carved with a representation of the story of Dionysus and the pirates, who being thrown into the sea became metamorphosed into dolphins. The antefixes, which usually form the terminations of the cover tiles, are here brought out over the front of the corona and carved as a decorative cresting. The roof, which is one block of marble, has its upper surface carved in imitation of bronze scale tiles (Plate LIV). In the centre rises the finial designed to carry the tripod, and from the lower portion of it project three helices or scrolls; which it is thought supported figures or dolphins. In the upper portion of this finial we recognise the further development of a design which we shall see in the Acanthus Column at Delphi ; here, in addition to the acanthus leaves, we find the volute used to give variety and greater strength to the support of the tripod.

Other choragic monuments of the period were not so elaborate. A favourite type was that of the temple, which was adopted for instance in the choragic monument of Nicias, of 319. B.C. This consisted of a square cella with a prostyle hexastyle Doric portico, and stood near the theatre of Dionysus ; but it was demolished at about 250 A.D. to furnish material for the Roman gate to the

Acropolis, later to be described.\* The other choragic monument of the same year 319 B.C. was erected by Thrasyllus, as a façade enframing a cave just above the theatre (Plate LVII), crowned by an attic with a statue of Dionysus now in the British Museum.

The temple type was also employed for the most elaborate sepulchral monuments, as, for instance, the Nereid Monument at Xanthus (Fig. 60), now in the British Museum. The lower portion was a lofty podium or basement, decorated with superposed bands or friezes of sculpture; and the structure carried on the podium was a reproduction of a small Ionic tetrastyle peripteral temple, with the figures of Nereids between the columns, with capitals imitated from those of the Erechtheum, with a sculptured architrave like that at Assos but without a frieze, and with carved pediments.

The most important of these sepulchral monuments was the Mausoleum at Halicarnassus, built by Queen Artemisia in memory of her husband Mausolus, who died in 353 B.C. According to ancient writers, the monument ranked among the seven wonders of the world, owing to the eminence of the artists who were called in to adorn it with sculpture; their names, as given by Pliny, were Bryaxis, Leochares, Timotheus, and Scopas. The architects were Pythius, who also sculptured the marble quadriga on the top (and, as we have seen, designed the temple at Priene), and Satyrus. The site was excavated in 1856 by Sir Charles Newton, and the remains discovered were deposited in the British Museum. But long previous to their discovery the conjectural restoration of the monument had been a favourite problem with many architects; and some of these restorations, including that of Cockerell, are now exhibited in the British Museum. Cockerell's restoration was based on the description given by Pliny and other authors; and, although the actual remains have proved it to be incorrect in some of its features, its architectural design sets forth the intimate acquaintance of its author with the principles of Greek art.† Unfortunately Pliny's description is so vague, and

\* The old theory that it was demolished at about 161 A.D. to leave space for a road up to the Acropolis behind the new odeum of Herodes Atticus must now be abandoned.

† The exceptions to be taken to Cockerell's design are the square piers at the angles, the introduction of the attic storey, the rise and tread of the steps of the pyramid and their design, and the question whether the cella in the centre is in accord with Martial's description of the Mausoleum as "hanging in open air."

the remains found are comparatively so few, that the problem is yet far from being solved. The lower portion of the structure consisted of the lofty basement or podium, set in the foundation cutting measuring 108 by 127 feet, discovered by Newton, and roughly corresponding to the 440 feet mentioned by Pliny. Above

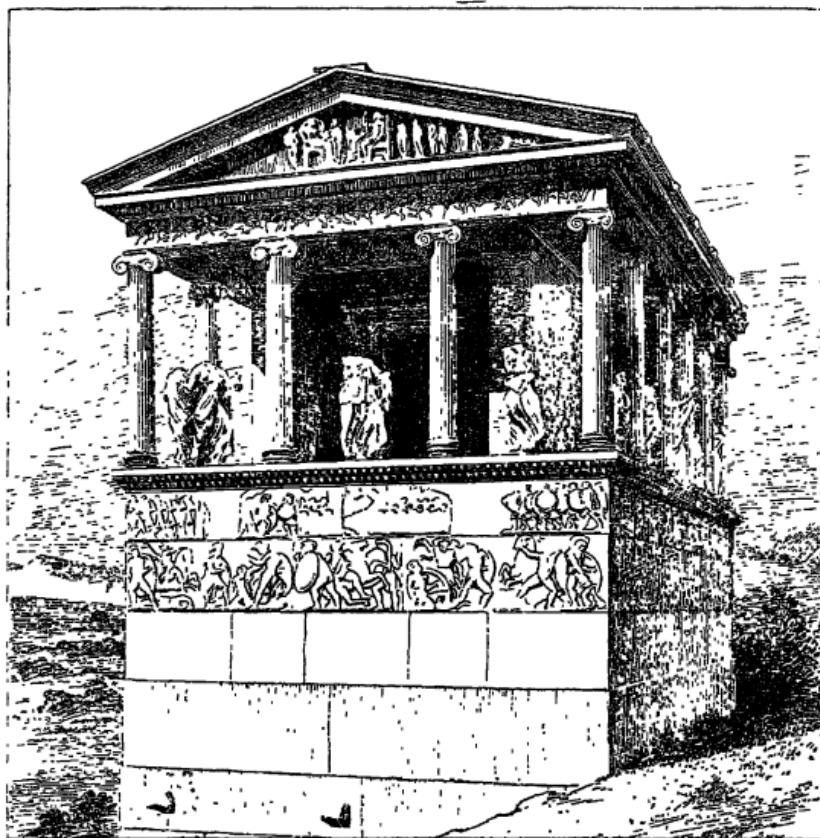


FIG. 60.—THE NEREID MONUMENT AT XANTHUS. (Restored by Niemann.)

this was the second element, the peristyle of thirty-six columns, as Pliny gives the number, necessarily including the angle supports as is evidenced by the angle capital discovered; he gives twenty-five cubits as the height of the pteron, a dimension which accords with the height of the order in the British Museum. With regard to the arrangement of these columns there are two theories, each

of which has its adherents ; some place them in a single peristyle large enough to cover the entire area of the foundation cutting, while others, with less probability, contract the plan of the peristyle by using dipteral colonnades. Even with respect to such details as the form of the entablature there are two dissentient views, depending on whether we insert the Amazon frieze or omit the frieze altogether on the analogy of the temple at Priene (Plate LIII).\* The total height of 140 feet was attained by means of a third element, a pyramid of twenty-four steps, crowned by the quadriga ; but here again there are two types of solutions, some (especially those with the contracted peristyle) representing a narrow and lofty pyramid, while others use a lower pyramid with a more gradual slope in accordance with the steps found in the excavations, and are therefore obliged to supplement it with an attic above the peristyle and a pedestal below the quadriga ; some compromise by using the narrow type of pyramid above the wider peristyle plan, by making it rise from an attic carried by the cella walls rather than by the columns ; others again utilise the steps with broad treads (which undoubtedly belong to the roof) for the lower degrees of the pyramid, and raise the upper portion into the form of a meta according to Pliny's description by employing other steep steps which were found on the site—but with a defect in the abrupt change between the two slopes.† Another difficulty is that of supporting adequately the pyramid, which Martial describes as “ hanging in open air,” while Pliny gives dimensions of 63 feet on the flanks, and a shorter width on the fronts, apparently intended to apply to a cella within the peristyle, distant either one or two intercolumniations behind the peristyle, at the choice of the investigator. And into the restoration have to be worked, furthermore, three different sculptured friezes, the numerous decorative lions, and a host of statues including those of Mausolus and Artemisia.

Though coming more within the range of sculpture than of architecture, the marble sarcophagi found at Sidon by Hamdy

\* Plate XLIX shows the restoration of the entablature as set up in the British Museum.

† This is the case, for instance, in Stevenson's restoration in the British Museum ; if the junction of the two sets of steps had been broken by plinths and antefixes, as in Cockerell's attic storey, or, better still, by pedestals carrying the famous lions, these would have masked the transition from the low to the high pitch of the pyramid.

Bey, and now in the Museum at Constantinople, are magnificent examples of the decorative sculpture of the end of the fourth century, and in consequence of their good state of preservation show the extent to which polychromy was employed to enrich the elaborately carved mouldings.

The favourite type of sepulchral monument in Attica at this time was the vertical slab known as the stele. As an example we

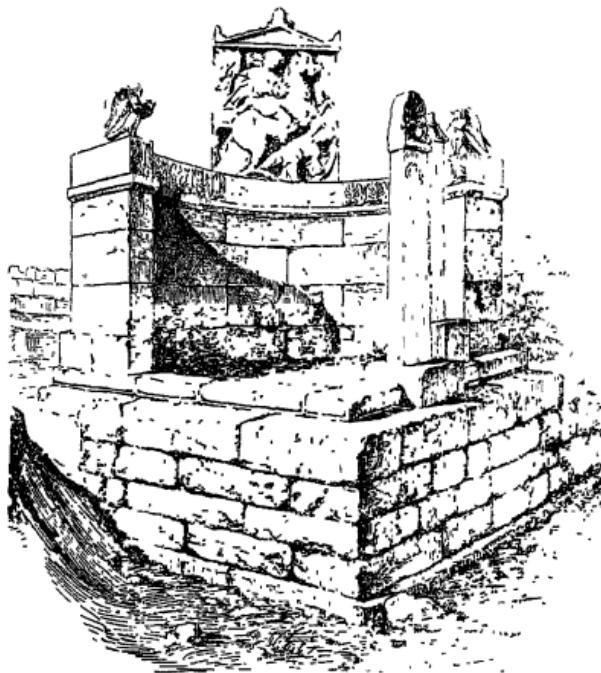


FIG. 61.—GRAVE MONUMENT OF DEXILEOS AT ATHENS.  
(Restored by Kinch.)

may take one of the many family burial plots which lined the Sacred Way from Athens to Eleusis, that of Dexileos (Fig. 61). The subordinate stelae are still of the narrow type used in the archaic period (Fig. 35), but with much more elaborate acroteria in which the acanthus plays a great part. The main monument, however, is of a much broader type, giving more scope for relief sculpture. The scenes represented in these sepulchral reliefs are generally of a domestic character, as, for instance, the husband bidding adieu to his wife who is called away to another world;

but the stele of Dexileos is unusual in representing a scene of battle.

Among the smaller votive monuments of this period, erected in the sacred precincts, the most interesting, apart from those in the form of simple columns, is the Acanthus Column found at Delphi (Fig. 62), dating from the very beginning of the fourth century. The lower part of the shaft rises from a calyx of three large ribbed

leaves, and at the base of every drum the upward movement of the shaft is interrupted by a girdle of acanthus leaves; from the upper portion of the shaft spring three other acanthus leaves which support Caryatid figures carrying a tripod. The great projection of these leaves, and the vigour shown in their carving, testify that as a decorative feature the foliage of this plant must have been intensively and rapidly developed since its adoption a few years previously.



FIG. 62.—THE  
ACANTHUS  
COLUMN AT  
DELPHI.  
(Restored by  
Homolle.)

served as the temporary refuge of the patients who came to the shrine of Asclepius to be healed of their ailments.

A structure analogous in form, but totally different in purpose, was the Arsenal of the Piraeus near Athens. Although the building no longer exists, having been burnt by Sulla in 86 B.C., the description of it given in the specifications, which were found in 1882, engraved on a slab of Hymettian marble, is so clear and distinct that we know more about its construction than if its actual remains,

rather than the inscription, had been found. It is of particular importance on account of the light that it sheds on the question of the construction of the Greek roofs, about which so little is known, owing to the complete destruction by fire or otherwise of all the timber therein employed. The arsenal was built between 340 and 330 B.C. from the designs of Philon, the architect of the façade of the Hall of the Mysteries at Eleusis ; and it was intended for the storing of the rigging, sails, ropes, etc., of the Athenian navy. It was 430 feet long by 59 feet wide, and consisted of a

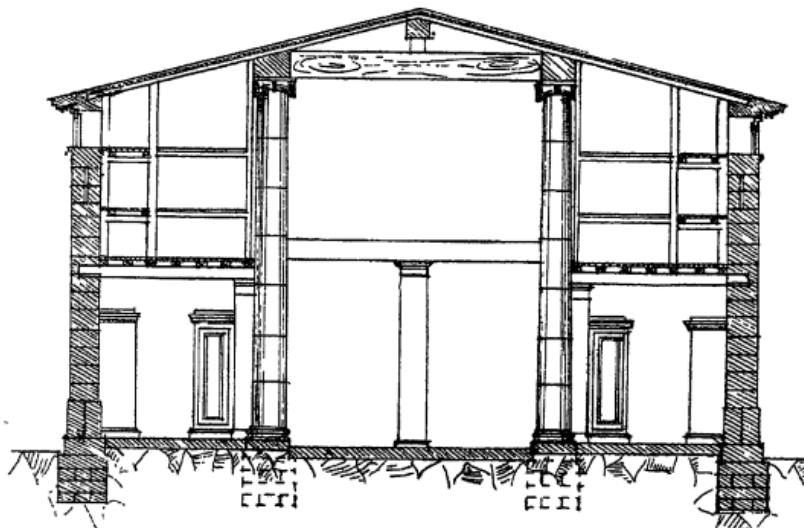


FIG. 63.—TRANSVERSE SECTION OF THE ARSENAL AT THE PIRAEUS.  
(Restored by Dörpfeld.)

central passage and two aisles (Fig. 63). The former, 21 feet 6 inches wide, served as a covered promenade ; and in the aisles, separated from the nave by stone Ionic columns 32 feet in height and by screen walls with gates in them, were stored the sails and ropes, with galleries above for the smaller materials. The columns, thirty-five in number on each side, carried huge beams (32 inches wide by 29 inches high) longitudinally as architraves, serving also as purlins of the roof ; and they also carried transverse beams of the same dimensions across the central passage. On the centre of each of these transverse beams rested a block of timber which supported the ridge beam ( $22\frac{1}{2}$  inches by  $17\frac{1}{4}$  inches). Resting

on this ridge beam, on the longitudinal architraves, and on the flank walls were rafters 12 inches wide and 8 inches high, and 16 inches apart. Across the rafters were laid battens,  $6\frac{1}{2}$  inches by  $1\frac{1}{2}$  inches, and  $3\frac{1}{2}$  inches apart, carrying the close boarding on which the Corinthian terracotta tiles were laid, bedded in mud. From this description it follows that the trussing of timber in roofs was unknown to the Greeks, and that the rafters were carried by the ridge beam and by other direct vertical supports.\*

Another Greek secular building which must here be mentioned is the Thersilion or Assembly Hall of the ten thousand Arcadians at Megalopolis (Fig. 64). The plans, published in 1890 by the

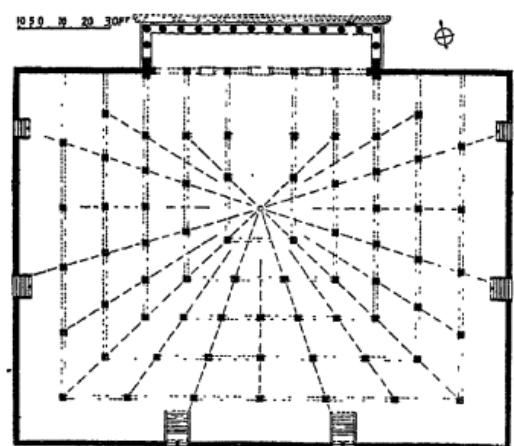


FIG. 64.—THE THERSILION AT MEGALOPOLIS.  
(Restored by R. S. Weir.)

Hellenic Society, show that the hall covered an area of 35,000 square feet, and that the columns which carried its roof were ranged in lines parallel to three sides of the hall, and furthermore on the intersections of lines radiating towards the tribune, so as to form the least possible obstruction to the view from any portion of the hall.

No architectural

features of the interior were found, but the bases of the columns which remained *in situ* proved by their respective levels that the floor of the assembly hall sloped downwards towards the tribune. Behind the columns were two entrances on each of the three sides as in the similar Hall of the Mysteries at Eleusis; but on the fourth side was a great frontispiece, a prostyle portico with fourteen columns on the front, facing towards the theatre.

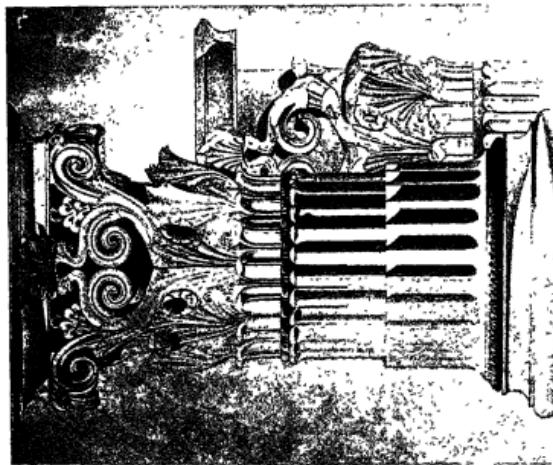
The plan of the theatre, by the fourth century B.C., had become

\* Further evidence of the same is given in the Lycian, Phrygian, and Etruscan tombs, where are found reproductions of timber roofs carved in stone.

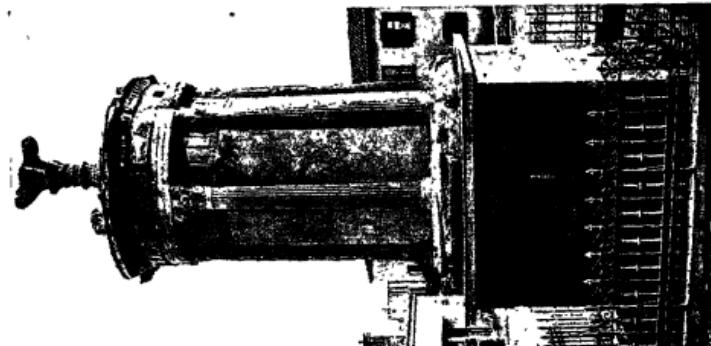
PLATE LV.



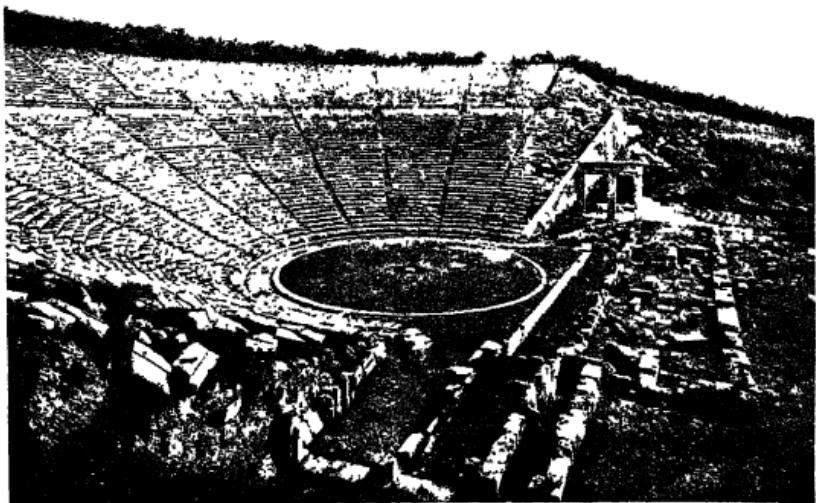
THE CHAIR OF THE HIGH PRIEST OF  
DIONYSUS IN THE THEATRE  
AT ATHENS.



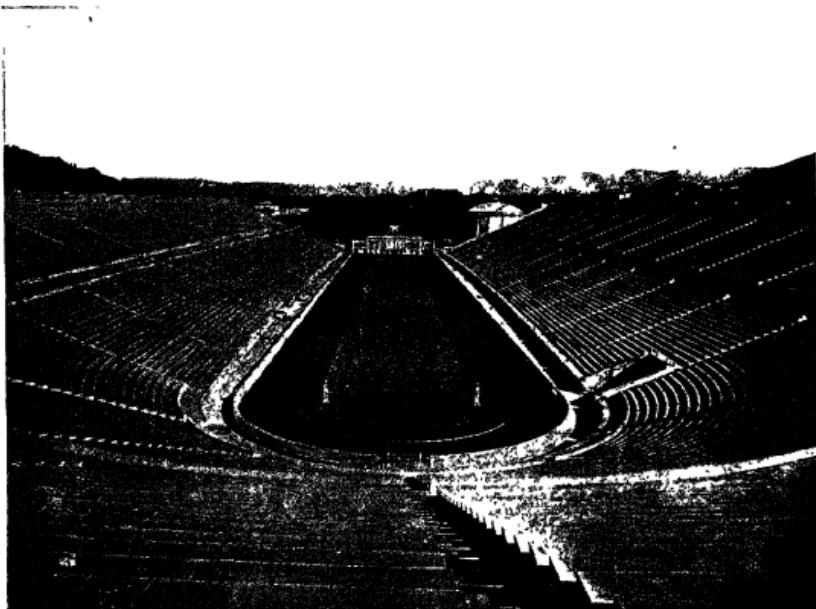
CAPITAL OF THE CHORAGIC MONUMENT  
OF LYSICRATES  
(DRAWN BY LOVIOIR).



THE CHORAGIC MONUMENT  
OF LYSICRATES AT ATHENS.



VIEW OF THE THEATRE AT EPIDAURUS.



THE PANATHENAIC STADIUM AT ATHENS.

well established and had assumed a monumental form. Most typical, and also one of the best preserved, is the example erected by Polyclitus the Younger (the designer of the tholos) at Epidaurus (Fig. 65; Plate LVI). Three parts may be specified—the orchestra, the cavea or auditorium for the spectators, and the scene building. The orchestra forms at Epidaurus a complete circle, but in other examples was gradually encroached upon by the bringing forward of the scene building; in the centre the altar of Dionysus was still retained, and here took place most of the action of the play.

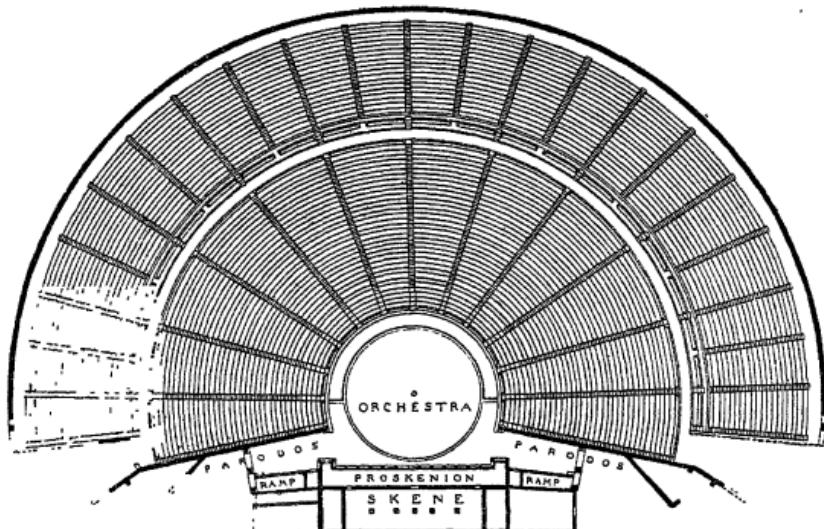


FIG. 65.—THE THEATRE AT EPIDAURUS. (Restored by Dörpfeld.)

The cavea at Epidaurus has a diameter of 415 feet; at Megalopolis it was 474 feet, forming the largest known auditorium; at Athens the maximum width was only 364 feet, though the plan is very irregular (not being bounded by the usual semi-circle) and in the upper portions the radius was increased to 276 feet, giving a tremendous depth. The seats are divided by radiating stairways into wedge-shaped groups or cunei. The seats immediately round the orchestra are sometimes in marble, with backs shaped like the chairs of the early Victorian period; as in the theatre of Dionysus at Athens (Plate LV), where there were sixty-seven marble chairs inscribed with the names of the priests

or other dignitaries who occupied them (Plate LVII). Once (or sometimes twice) in its total height the cavea is subdivided by a horizontal passage known as the diazoma. The form and purpose of the scene building are contested subjects; but it would appear that it still continued to form merely a back scene for the action, though it now assumed a permanent architectural form, an unvaried street or palace scene. Thus at Megalopolis the portico of the Thersilion originally served also as the back scene of the theatre, though subsequently a lower colonnade, called the proscenium, was erected before it. This colonnaded proscenium, sometimes with projecting pavilions (*parascenia*) on either side, now became the characteristic feature of the scene buildings; at Epidaurus it was faced with three quarter detached columns, and its roof formed a narrow platform 11 or 12 feet high, reached by ramps on either side, and probably used only for action purporting to take place at high levels, on house tops, walls, or mountains. Among smaller details, it may be noted that at Epidaurus these semi-detached columns are Ionic, and that in their capitals, as at Bassae, the volutes are bent anglewise at the corners.

The stadium or racecourse was an elongated space 600 to 900 feet long, the site for which, like that of the theatre, was selected close to the side of a hill or between two hills, so that, even at the worst, it would be necessary to build up an embankment only on one side. At Messene it was placed in a narrow valley, and at the end where the goal was placed there were colonnades in the form of a semicircle. The oldest stadium in Greece was probably that at Olympia (Plate XXIV, ST), 630 feet long, but no traces antedating the fourth century have been discovered; the entrance to it from the Altis is through a passage 100 feet long and 13 feet wide, carried under the west embankment of the stadium, and covered over with a stone barrel-vault, which is probably the result of an alteration in the third century, but important as evidence that the Greeks were well acquainted with the arched vault, and employed it where, as in this case, it received ample abutment from the ground on each side. The Panathenaic stadium at Athens (Plate LVI), 670 feet long, was constructed of poros stone by the legislator Lycurgus, who was also responsible for the erection of the Athenian theatre in stone at about 340 B.C.; it was only long

PLATE LVII.



THE THEATRE OF DIONYSUS AT ATHENS,  
with the Choragic Monument of Thrasyllos,  
Choragic Columns, and Acropolis Wall.



afterwards, at about 160 A.D., that the stadium was reconstructed in Pentelic marble by Herodes Atticus.\*

For horse and chariot racing a longer course was provided, known as the hippodrome; but of such buildings of the Greek periods no actual remains have been discovered.

The gymnasium of this period was still informal in plan; the most notable example is that at Delphi (Plate II) well adapted to the natural site, with a racecourse 600 feet long on an upper terrace, and baths (both shower and plunge) and a court for wrestling below it.

\*Plate LVI shows this stadium of Herodes Atticus as rebuilt for the Olympic Games of 1896.

## CHAPTER VII

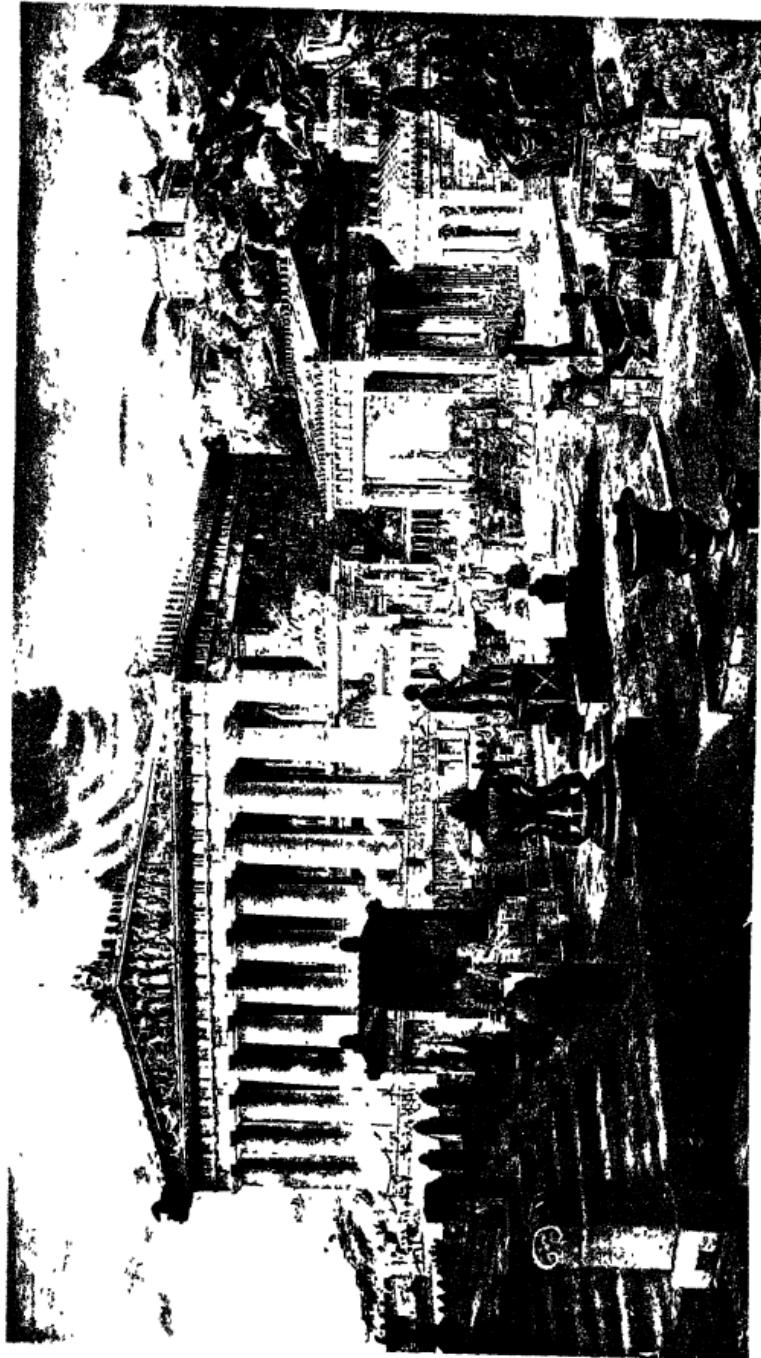
### THE HELLENISTIC AND GRAECO-ROMAN PHASES

THE monuments which testify to the greatness of Greece even in her decline may best be studied, like those of the fourth century, in Asia Minor. For after the supremacy of the mainland cities had been shaken by Philip of Macedonia at the battle of Chaeronea, his successor, Alexander, turned to Asia, and routed the Persian hosts at the Granicus (334) and Issus (333). Now was built up a Greek empire of which Greece proper formed but a small province ; the capital lay at Babylon, and the boundaries extended eastward to India and Turkestan, and southward to Nubia. After Alexander's death in 323 b.c. this vast territory was broken up into separate kingdoms ruled by his generals and their successors. For the moment, at any rate, the course of civilisation receded eastward ; and it is largely in these oriental kingdoms, carved out of Alexander's empire, that we must study the last phase but one, an architecture which, imitating the classical styles of the true Hellenic lands, is therefore termed Hellenistic.

This political reconstruction of the Greek world was not long suffered to remain undisturbed. From two quarters arrived external forces to dispute the supremacy of the eastern Mediterranean ; and the Greeks successfully repulsed the Gallic invasions only to fall before others whom they likewise regarded as Barbarians, the Romans. The westward march of empire could no longer be arrested.

The Romans had come into contact with the Greeks at the very beginning of the Hellenistic period. The rich Greek colonies of southern Italy and Sicily tempted the rapidly expanding state on the Tiber ; and as early as 282 b.c. began the annexation of the Greek cities of Italy, and then, with the first Punic war (264-241 b.c.) began the second stage, the penetration of Sicily. The second Punic war (218-202 b.c.), furthermore, brought the Romans

PLATE LVIII



THE PRECINCT OF DEMETER AT ELEUSIS (RESTORED BY GANDY-DEERING).



into the East; the four Macedonian wars (215-146 B.C.) left Macedonia a Roman province and, though the Greek leagues had at first been the allies of Rome against Macedonia, their continual quarrels invited Roman intervention, and they were crushed by Lucius Mummius (146 B.C.), Corinth being destroyed as an act of terrorism and Greece itself annexed to the province of Macedonia. The war against Antiochus (192-189 B.C.) brought the Romans for the first time into Asia, where the Greek kingdoms one by one fell under western sway, Pergamum through the bequest of its last king (133 B.C.), and others, as Syria (63 B.C.) and Egypt (30 B.C.), through conquest.

The last phase of Greek architecture, then, is that of the period when the free states had been subjugated or otherwise annexed to Rome, and which we may therefore call Graeco-Roman. During this epoch, we are not concerned with such outlying regions as Syria and Egypt, to which Greek civilisation was brought only by the Hellenistic kings, and which soon lost their Greek veneer, taking on a new veneer, that of their Roman conquerors. But in Greece proper, in Asia Minor, and in parts of southern Italy and Sicily, the ingrained Hellenism of the native Greek inhabitants lived on, either affecting the architecture of the new rulers, or even continuing to produce architecture which might be called Greek. Shiploads of paintings, statues, and decorative architectural pieces were sent to Rome; but to compensate for this, the Roman emperors carried on a vast amount of architectural activity in Greece and Asia Minor, and these late buildings, on which Greek artists would seem to have been invariably employed, are just as much a part of the development of Greek architecture as are their more purely Hellenic predecessors.

\* \* \* \* \*

At this period the erection of Doric temples was virtually abandoned; and Vitruvius reflected the sentiments of his immediate predecessors, the Hellenistic architects of Asia Minor, in his reference to the assertion of "some ancient architects that sacred buildings ought not to be constructed of the Doric order." In the western colonies we hear only of a few examples on a very small scale. The small prostyle temple "B" at Selinus is an instance; the order was clearly Doric, and the remarkable Ionic capital shown in Hittorff's restoration has been recognised as belonging probably to a votive column. Likewise the little temples

of Asclepius at Acragas (Fig. 66) and of Serapis at Taormina might be described as distyle in-antis, though they show also at the rear a false portico of two semi-detached Doric columns between antae ; the employment of the semi-detached columns here was undoubtedly inspired by the great temple of Zeus Olympius at Acragas, though it was not warranted by their small dimensions. The dates of these temples seem to lie between 240 and 210 B.C. On the Greek mainland we hear of one or two more ambitious projects, but sometimes they came to nothing, as was the case with the temple of Zeus at Lebadea in Boeotia—even this being an undertaking of the Asiatic monarch Antiochus IV. And while in the Ionic area

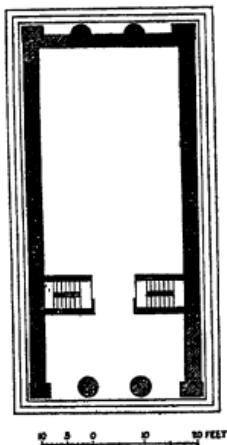
we find one or two Doric intruders, such as the temple of Athena Polias and that of Dionysus at Pergamum, yet these are of small size and show numerous modifications due to Ionic influence, such as the excessively slender proportions (which in the frieze led to the multiplication of the number of triglyphs), the use of Ionic fluting, the substitution of a series of mouldings for the Doric echinus, etc. In other words, the supremacy had passed entirely to the Ionic and, as we shall see, also to the Corinthian style, which now for the first time began to be employed on the exteriors of temples.

Sometimes, however, we meet evidences of a more archaeological tendency, particularly in the reigns of Hadrian and the Antonines, when there were attempts to revive the

FIG. 66.—THE TEMPLE  
OF ASCLEPIUS AT  
ACRAGAS.

purity of the classical styles. An instance in point is the little temple of Artemis Propylaea at Eleusis, of which the forms look as if they were designed long before the reign of Marcus Aurelius, its probable date. The plan of this temple is of special interest because, while formerly restored as distyle in-antis at both ends, it has now been proved to have been amphiprostyle like so many of the small Ionic temples.

The most important architect of the period was Hermogenes, who codified the rules for the Ionic order in books which were frequently consulted by the Romans. One of his works, at about 150 B.C., was the temple of Dionysus at Teos, a small hexastyle



peripteral example, with eleven columns on the flanks ; he is reported to have designed this in the Doric style, subsequently altering it to the Ionic. The bases and capitals are of poor design ; the tendency of the Hellenistic and Graeco-Roman periods was to raise the carved echinus of the capital more and more, so that it ultimately ranged with the top of the second convolution of the volute (compare Plates XLIII and LX), and in this case disappeared entirely under the baluster side of the cushion. But the most remarkable innovation of Hermogenes was, according to Vitruvius, his plan of omitting the inner row of columns in the temple of Artemis Leucophryene at Magnesia - ad - Maeandrum,

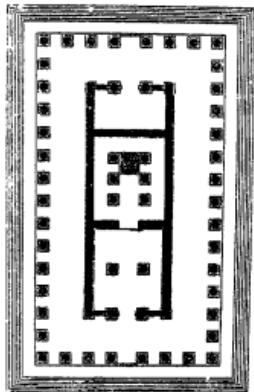


FIG. 67.—TEMPLE OF ARTEMIS LEUCOPHRYENE AT MAGNESIA-AD-MAEANDRUM.

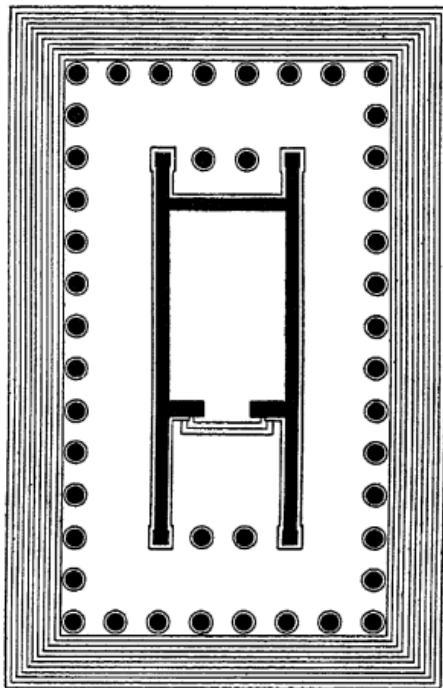


FIG. 68.—TEMPLE OF APOLLO SMINTHEUS (SMINTHEUM) IN THE TROAD.

making it pseudo-dipteral (Fig. 67) ; for in the fifth century this temple had been dipteral. The new temple was octastyle, with fifteen columns on the flanks, and, like the temple at Ephesus, was raised on a lofty platform ; the inner building has the usual pronao, cella, and opisthodomus. Another fine example is the temple of Apollo Smintheus in the Troad, again octastyle pseudo-dipteral, with fourteen columns on the flanks (Fig. 68) ; the capitals show a further enrichment above the egg and tongue moulding. Almost

identical in plan is the temple at Messa in the island of Lesbos, again octastyle pseudo-dipteral, with fourteen columns on the flanks; the purity of the Ionic capitals and bases recalls those on the Athenian Acropolis. Similar traditions were observed in the Ionic temples of Aphrodite at Aphrodisias and of Zeus at Aezani in Phrygia; these two are of late date, but were executed by Greek artists still working on ancient tradition, and so retain a much greater purity of style than that found in most Roman work. The capitals of the columns of the pronaos at Aezani (Fig. 69) are decorated with a single row of acanthus leaves under the volutes, showing therein the influence of the Roman composite capitals.

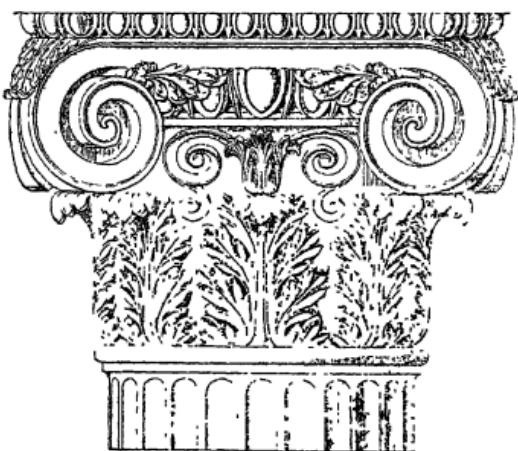


FIG. 69.—CAPITAL OF COLUMN IN PRONAOS OF  
TEMPLE OF ZEUS AT AEZANI.

The most notable of the Corinthian temples is that dedicated to Zeus Olympius and situated in the plain to the south-east of the Acropolis at Athens. The temple was built on the foundations of an earlier Doric structure founded by the sons of Pisistratus;

the new building was commenced by Antiochus IV Epiphanes in 174 B.C., from the designs of the Roman architect Cossutius. Penrose's researches in 1884 proved the temple to have been octastyle, with twenty columns on the flanks (Fig. 70); its dimensions on the stylobate were about 135 by 354 feet, and it was built in the centre of a peribolus measuring 424 by 680 feet. The temple was dipteral, with two rows of columns on each side of the cella, and three rows across the front and rear, a total of one hundred and four columns apart from any that may have been inserted in the pronaos and opisthodomus. The structure as designed by Cossutius was left incomplete; and in 86 B.C. some of the capitals and shafts, probably of monolithic columns

PLATE LIX..



THE TEMPLE OF ZEUS OLYMPIUS AT ATHENS.



prepared for the cella, were transported by Sulla to Rome and used to decorate the temple on the Capitol, thereby exercising a profound influence on the Roman Corinthian style. The work was resumed in the time of Augustus, but its completion and dedication were reserved for Hadrian in 131 A.D. The temple is one of those described by Vitruvius as hypaethral, but we are left in doubt whether the whole of the cella was intended to be left uncovered or only its eastern portion; and there is of course no evidence that when completed by Hadrian any portion of the temple was hypaethral, because in the time of Vitruvius the cella was still incomplete. The diameter of the columns of the peristyle is 6 feet  $3\frac{1}{4}$  inches, and their height is 55 feet 5 inches, giving a relation of diameter to height as 1 to 8.77, inclusive of the square plinth, an unusually solid proportion for the Corinthian order (Plate LXIX). According to Penrose, some of the capitals (Fig. 71) belong to the design by Cossutius, being much too pure in style to have been executed under Augustus, and still less in Hadrian's time; the carving of the foliage resembles more that of the tholos of Epidaurus, than that of the arch near the temple and the library both built by Hadrian. The capitals, however, vary in execution, so that part of the work would seem to be that of Hadrian, copying the original design.

There are other Corinthian temples in Asia Minor, such as the one at Euromus (near Ayakli), which is hexastyle peripteral, with eleven columns on the flanks; sixteen of the columns are yet standing. Some of these columns have tablets worked on them, with inscriptions recording the names of the donors, as is also the case on an isolated Corinthian column at Mylasa and on the Ionic columns of the temple at Aphrodisias. Of a second temple

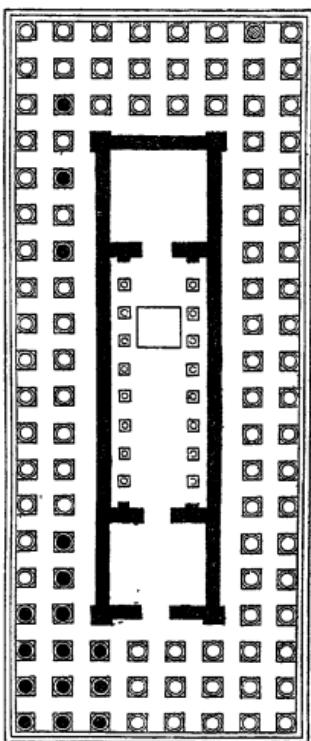


FIG. 70.—TEMPLE OF ZEUS OLYMPIUS AT ATHENS.

at Ancyra (Angora), dedicated to Augustus and Roma, only the cella and pronaos remain, though it was once surrounded by a hexastyle peripteral colonnade. A third example, of similar plan, was dedicated to Antoninus Pius at Sagalassus. More unusual was a pseudo-peripteral Corinthian temple at Cnidus, of uncertain date.

An unusual plan, reminiscent of the tholos of the fourth century, was that of the temple of Roma and Augustus on the Acropolis at Athens (Figs. 51, L ; 72), a monopteral plan consisting of a

circle of nine Ionic columns imitated from those of the Erechtheum, with a diameter of only 23 feet, and without a cella.

\* \* \*

It was during this period that the approach to the Athenian Acropolis received its final form. On the north side, approximately balancing the temple of Athena Nike, was built the lofty Pergamene



FIG. 71.—CAPITAL FROM THE TEMPLE OF ZEUS OLYMPIUS AT ATHENS.

pedestal which eventually supported the chariot of Marcus Agrippa (Plate XLVI). Later was erected the tremendous flight of marble steps, 71 feet in width, which ascended in two flights; the upper of which was subdivided by a central ramp paved with marble, intended for the beasts of sacrifice brought up in the procession which rounded the corner of the bastion of Athena Nike and so attained the landing halfway up the ascent. The marble steps led directly up to the lowest step of the west façade of the Propylaea (*cf.* Plate XLVI); at the bottom, however, they originally seem to have been left open. Here at the bottom of the flight was eventually built, at about 250 A.D., the new entrance discovered by Beulé in 1852, and hence



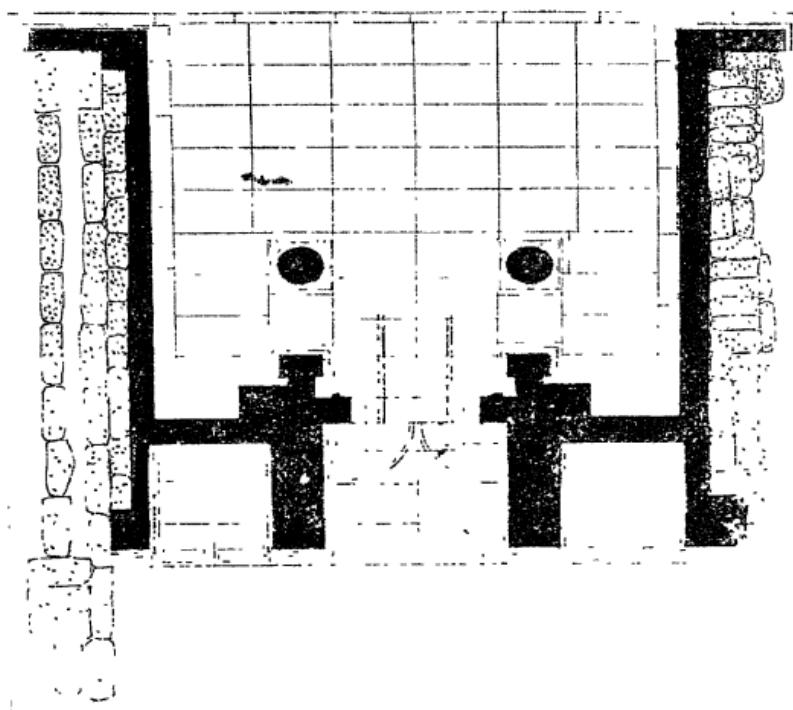
CAPITAL FROM THE TEMPLE OF ARTEMIS AT MAGNESIA  
(BERLIN MUSEUM).



CAPITAL FROM THE LESSER PROPYLAEA AT ELEUSIS.



ENTABLATURE FROM THE LESSER PROPYLAEA  
AT ELEUSIS.



THE LESSER PROPYLAEA AT ELEUSIS  
(RESTORED BY LIBERTINI).

known as the Beulé Gate (Plate I; Fig. 51, M), built with material taken from the choragic monument of Nicias.\*

At Eleusis the sacred precinct of the temple was entered in Roman times through two successive gateways known as the Greater and the Lesser Propylaea. The latter were built first, by Appius Claudius Pulcher, soon after 54 B.C. The plan differs from that of other propylaea (Plate LXI) : there is a paved forecourt flanked by two walls at the right and left of the entrance, with crowning entablatures,† whilst two columns outside the doorway and two Caryatids inside it supported the roofs which merely sheltered the entrance.‡ The capital shown in Plate LX, of Corinthian type, crowned one of the two outer columns, and is remarkable because of the unique hexagonal plan of the abacus and on account of the richly carved ornament, with winged horses at three corners. On these rested a mixed Doric-Ionic entablature, carved with emblems of Demeter (Plate LXI), cists and wheat sheaves on the triglyphs, rosettes and bucrania on the metopes ;§ the combination of Doric and Ionic forms illustrates the unsettled character of the Corinthian order in the period antedating the Roman

Empire, as described by Vitruvius. There are ruts formed by wheels on the pavement, implying that before the erection of the outer Propylaea the precinct was accessible for chariots ; the central doorway, through which these wheel ruts pass, was closed by massive gates as shown by marks on the pavement, while the lateral doorways are of later origin. Afterwards were built the outer or Greater Propylaea, exactly copied from the central building of the

\* See p. 149.

† The detached Ionic columns resting on a podium about 4 feet 6 inches high, the motive used in earlier restorations to line these flank walls, actually have no relationship to the building.

‡ One of these two Caryatids is preserved at Cambridge University.

§ On the site was also found a portion of another Doric entablature, comprising three triglyphs, on one of which is carved a bunch of ears of barley, on the second a cist, and on the third the torches carried during the ceremonies.

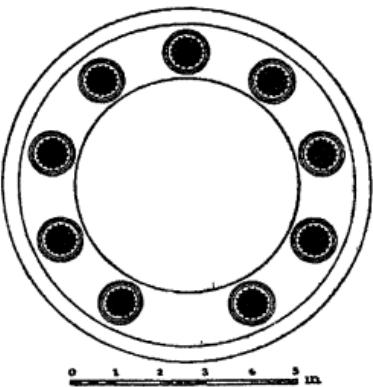


FIG. 72.—THE TEMPLE OF ROMA AND AUGUSTUS AT ATHENS.

Propylaea at Athens (again illustrating the archaeological tendencies of the Antonine period), both in design and in size, except that the hexastyle portico of the main front was raised on a platform of six steps, while the central passage for processions was omitted (Plate LVIII).

The propylaeum of the temenos of Athena at Priene is likewise of late date, and has tetrastyle porticoes of the Ionic order in the front and rear; one of the capitals is in the British Museum. A series of rectangular pier capitals of various sizes, formerly supposed to have crowned piers inside the propylaeum,\* have now been recognised as statue pedestals and as terminal motives of exedras. All are of the cradle type used in the fourth century

temples, and those which were used as statue pedestals have an additional member above the abacus to serve as the plinth of the statue (Fig. 73); in the tops of these plinths are sinkings in which were leaded the tenons below the feet of bronze statues. Two of these pedestal caps, and one exedra termination, are now in the British Museum.



FIG. 73.—CAPITAL OF PIER CARRYING A STATUE IN THE TEMENOS AT PRIENE.

Among the structures erected in the sacred enclosures were the altars, which in these later periods were often of considerable size, though beyond their foundations all traces of their design have generally disappeared. Of the Great Altar of Zeus at Pergamum, discovered by the Germans in 1880, sufficient remains have been found to justify a conjectural restoration, at all events, of its magnificent podium (Plate LXII). The altar was built by Eumenes II (197-159 B.C.), on the second terrace of the acropolis overlooking the valley of the river Selinus, and was raised on a

\* This restoration with internal square piers and flat pilaster strips on both faces of the flank walls, as suggested by the Dilettanti expedition in 1812, has no foundation in fact.

podium 17 feet 6 inches high, measuring in plan, on the lowest step, 119 feet 6 inches by 112 feet 3 inches. Round the sides, at a height of 8 feet 8 inches above the pavement of the terrace, was a frieze 7 feet 6 inches high, carved in high relief, representing the Gigantomachia, or battle of the Gods and Giants, three quarters of which are now in the Museum at Berlin. In the principal front, which was toward the west, was a flight of steps 68 feet 2 inches wide, which rose between the wings of the podium and led to the court of the altar. The court was surrounded by a wall also carved with reliefs, but in this case of lower relief and on the inner rather than the outer face. The inner face of the wall, furthermore, had a portico of double Ionic columns carrying a mere architrave; while on the outside of the wall was an Ionic peristyle, the columns supporting an entablature without a frieze, and returned on each side of the steps above the wings of the podium. In the centre of the court was the altar, of which portions of the entablature are preserved.\* Smaller imitations of this altar were erected at Priene and Magnesia.

On the terrace above the altar at Pergamum, the Doric temple of Athena Polias was enclosed within a rectangular court, lined on two sides with a colonnade or stoa in two storeys. Similar colonnades were erected at Delphi, in addition to the archaic Stoa of the Athenians, being located outside the enclosure on the east and west sides in order to shelter the pilgrims before their admittance to the temenos (Plate XXV). At Delos similar colonnades flanked the approach to the propylaea of the temenos, and on the north side of the temenos was the Portico of Antigonus, known also as the Stoa of the Horns because of the bulls' heads on the triglyphs; at the back of this stoa, and entered from it, was a series of chambers. One of the most remarkable buildings of this nature at Delos was the Sanctuary of the Bulls (Fig. 74), which measures 210 feet long by 30 feet wide, with a tetrastyle portico at one end, and at the farther end a hall at a lower level, to which one descended by a flight of

\* The restoration proposed by the Germans, with the colonnades returned across the top of the steps in front of the altar, would have masked the latter, whereas the sacrifices were probably intended to be seen from the plain below. Moreover, it does not accord with the representation shown on a Pergamene coin struck in the reign of Septimius Severus (193-211 A.D.), on which the altar, of simple design and of less height than the Ionic peristyle, is shown standing clear in the centre. In the conjectural restoration by Pontremoli, on the other hand, the peristyle is dwarfed by the immense altar shown.

steps, placed between two piers each decorated on one side with two kneeling bulls as bracket capitals, while the other side of each forms a half Doric capital.

Among the tombs of this period, we need refer only to a few. The mausoleum type, inspired by the example at Halicarnassus, was employed for the most monumental designs.

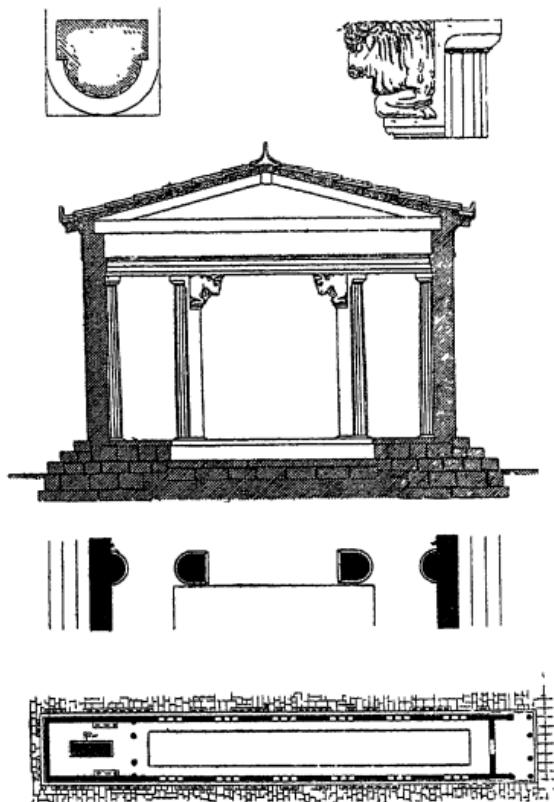
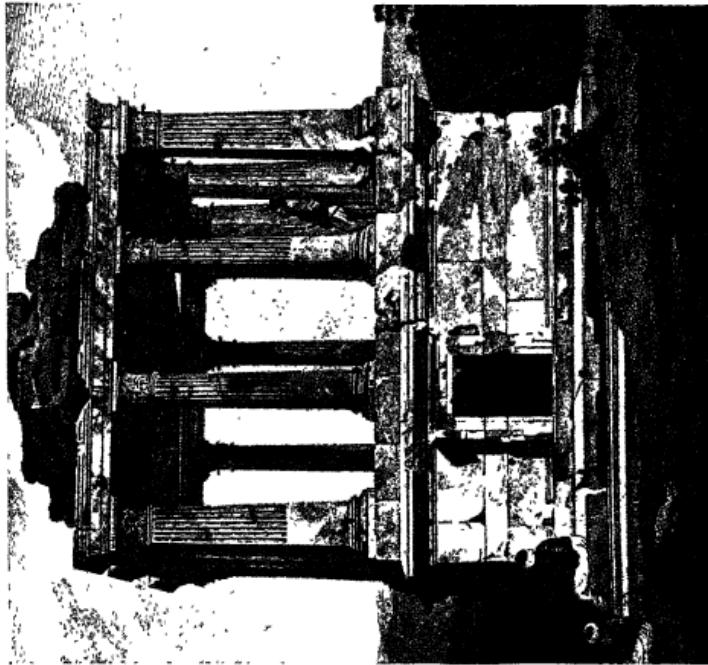


FIG. 74.—SANCTUARY OF THE BULLS AT DELOS.  
(Restored by Neot.)

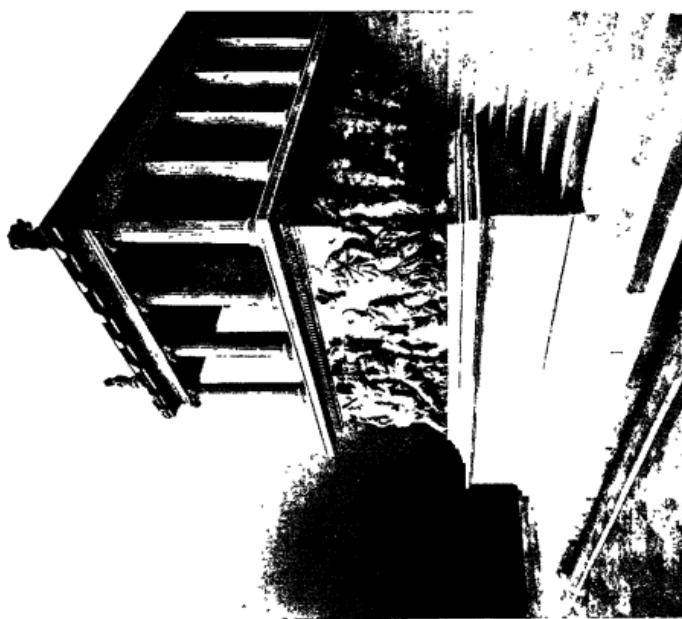
A tomb at Mylasa, although it belongs to the Corinthian order, was apparently based on the design of the great Mausoleum, and possesses the three divisions of podium, pteron, and pyramid. While it is of much smaller dimensions, the pyramid still exists and in a sense recalls Martial's description of its prototype, as it is entirely supported by the columns and piers (Plate LXII), the angles being tied inside by diagonal beams of stone across the four corners ; this

tomb therefore has sometimes served as an inspiration for restorations of the Mausoleum at Halicarnassus. In consequence of the great weight to be carried, there are square piers at the four corners, and the intermediate supports consist of columns of elliptical plan with narrow pilaster strips on each side. The so-called tomb of Theron at Acragas, with a lofty podium, has Ionic columns at

PLATE LXII.

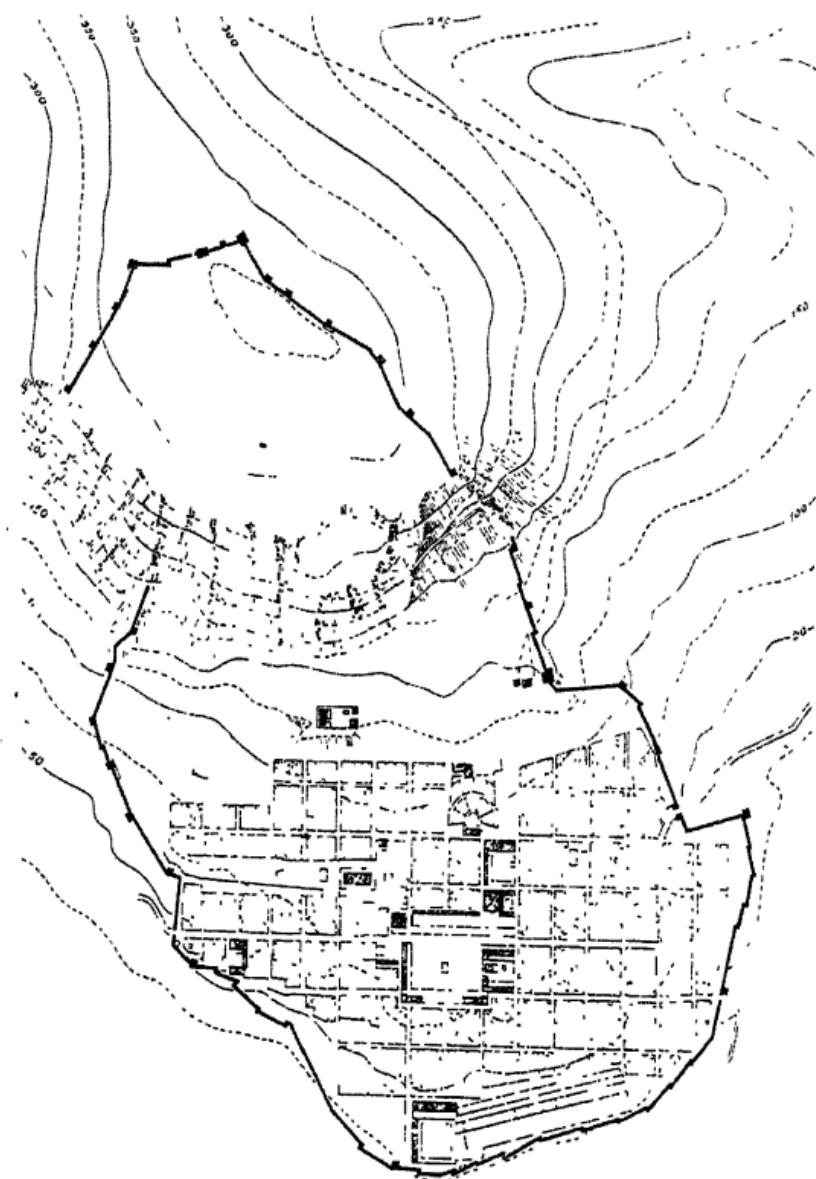


TOMB AT MYLASA.



DETAIL FROM THE GREAT ALTAR AT PERGAMUM  
(BERLIN MUSEUM).

PLATE LXIII.



PLAN OF THE CITY OF PRIENE (AFTER VON GERKAN).

each corner with canted volutes, and with a bold palmette to fill the gap between the volutes and the egg and tongue moulding, as in some examples at Olympia, and also at Pompeii, where it may well have been executed by Greek workmen ; the volutes have far less projection than is found in the ordinary type of Ionic capitals, so that it virtually constitutes a new design. Another frequent type of tomb at this period was the tumulus ; an example at Pergamum is of special interest because the chamber is covered by two intersecting barrel vaults regularly constructed with stone voussoirs, a notable prototype of Roman construction ; and the perfection of the execution in this tomb at Pergamum suggests that this was by no means the first attempt.

In addition to the temple precincts, the towns now for the first time begin to claim our attention ; for the earlier classical Greek periods we have very little information, but in the great cities of the Hellenistic and Graeco-Roman epochs now being uncovered by the spade, particularly in Asia Minor, we see a very different state of things from the prehistoric settlements of Troy and Mycenae. Of the typical arrangements of the Greek city, the clearest evidence comes from Ephesus, Miletus, Priene, Assos, Delos, Corinth, and Selinus.

To what extent the principle observed in connection with the temple precincts, that of taking advantage of the resources of the site, guided the Greeks in the planning of their towns, it is now difficult to say owing to the paucity of the examples remaining. Judging from remains found, all the principal points of advantage would seem to have been devoted to the temples, which usurped even the sites which in prehistoric times had been devoted to the palaces. The earlier cities were extremely irregular, with winding narrow streets laid out without regard for any consistent general scheme. But under oriental influence the cities of Asia Minor gradually developed a regular system of planning with all the streets crossing each other at right angles. One of the most notable, though smaller, examples of this is Priene (Plate LXIII), erected on a steep slope, yet laid out on a regular gridiron plan, with its six main streets running east and west, parallel to the slope of the acropolis and so approximately level, but crossed at right angles by sixteen sloping or stepped streets running north and south. The whole is built on terraces on the south slope of the acropolis ; the latter is so lofty that it was useless as a site for buildings,

and so was left at one side but enclosed within the fortifications. Though the streets form a perfect gridiron, the walls surrounding the whole follow a very irregular plan, taking advantage of the natural defences offered by the ravines which surround the plateau on three sides, the acropolis forming the fourth. At the centre of the city proper is the dominating precinct of Athena Polias, with the agora and the civic buildings behind it ; to the south, against the city wall, are the gymnasium and stadium, while to the north, cutting into the slope of the acropolis, is the theatre. The streets run through from wall to wall on the east and west, and from the wall on the south to the steeper slopes of the acropolis on the north, cutting the whole area into rectangular blocks each about 120 by 160 feet, and numbering, if there had been no interruptions and irregularities, ninety-five in all. The agora, however, has a length of three blocks and a width of two, dimensions in each case about a fifth of the length and width of the city ; the main east-and-west road, leading from the city's west gate, passed through the northern edge of the agora, while the next road to the south, leading from the "spring gate" at the east, likewise passed through the south side of the agora, but since it lay in general at a lower level it was interrupted by steps leading up to the agora level, while all traffic was diverted behind the south stoa ; the less important cross streets stopped short against the back walls of the stoas and were not carried through. In the richer residential districts of the city the blocks were divided into quarters, giving house lots about 60 by 80 feet ; but nearer the walls the divisions were smaller ; it may be calculated, on the basis of eighty habitable blocks with an average of six houses per block, that there were less than five hundred houses in the entire town.

Far richer, and displaying the magnificence of the Graeco-Roman period, was Ephesus, which was surveyed by Falkener and subsequently re-examined by Wood, who before he made his discovery of the temple of Artemis devoted some time to researches in the city ; the whole area is now being explored again by the Austrians. There were in reality two cities, the old Ionic city founded at about 1000 B.C. at the inner end of a deep bay (now silted up so that the site is about four and a half miles inland),\* on the east

\* Pliny tells us that the sea once reached even to the temple of Artemis. The amount of deposit brought down by the Caystrus river averages thirteen inches per century, as may be calculated from the fact that the ground level round the archaic "Croesus temple" was  $3\frac{1}{2}$  feet above sea level, while at present it is 26 feet higher still.

slope of Mount Pion, and the Hellenistic city founded on the west slope of the same mountain by Lysimachus at about 290 B.C., in order to regain access to the receding harbour. The Ionic city has

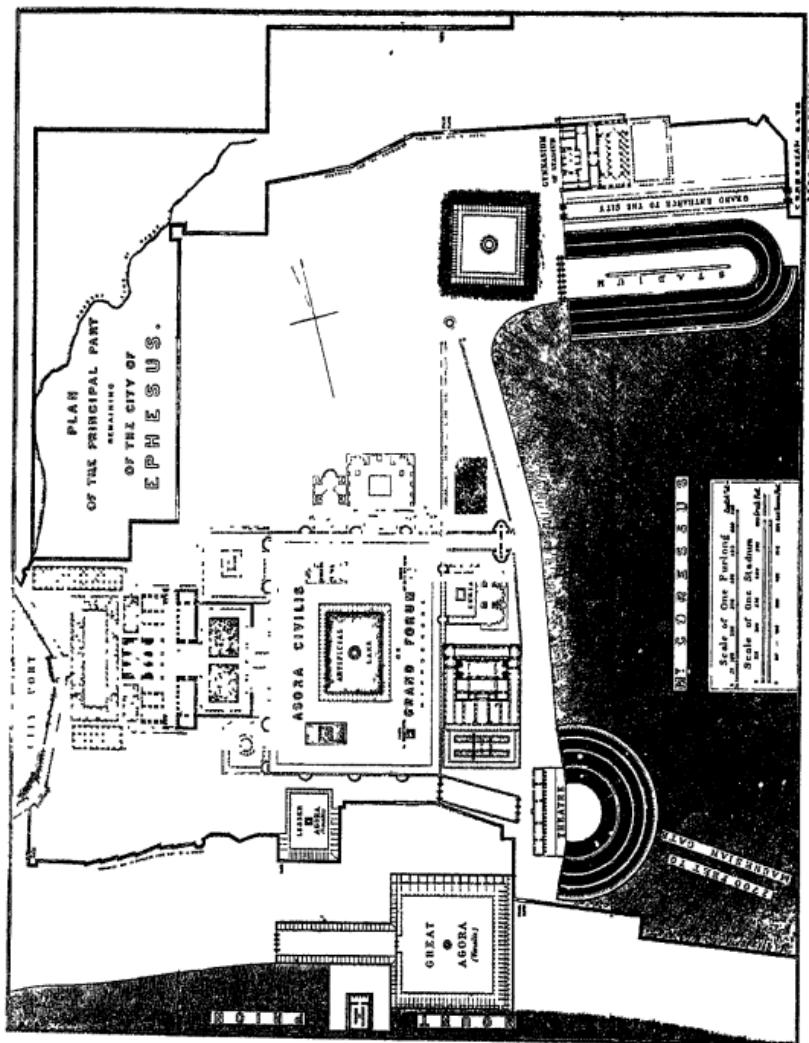


FIG. 75.—PLAN OF THE CITY OF EPHESUS (after Falkener).

never been found;\* the city of Lysimachus, with its revisions of Roman and early Byzantine times, is the one which has been

\* Herodotus tells us that it was seven stadia or four thousand feet from the temple of Artemis.

explored (Fig. 75),\* and may here be described as an instance of the splendour of the last phase. Although most of the actual remains found are Roman or even early Byzantine, they are in many cases built on Greek foundations or follow the general lines of the Hellenistic city, and thus will serve equally well to illustrate the plan, and the general employment of axes at right angles. The main axis, running east and west from Mount Pion to the harbour, is parallel to the higher Mount Coressus at the south ;† and upon this axis, beginning at the port, lie the great baths or Thermae, next the gymnasium (a great court with exedras at north and south), the two structures having in common an entrance from the south through a circular colonnaded court and a three aisled "atrium" ; and east of these, in turn, lie the great porticoes of Verulanus, three-aisled porticoes surrounding a rectangular court at about 650 by 800 feet.‡ Along the south side of this complex runs the straight street known as the Arcadiane, a third of a mile in length, paved with marble for a width of thirty-six feet, with colonnades seventeen feet deep on either side, with mosaic floors, and shops in turn behind these ; at the west end is a monumental gate opening on the port, at the east end a similar gate opening on the place before the theatre, on the north side are the entrances to the gymnasium and court of Verulanus, and in the middle of the road is a notable columnar monument marking the cross-roads. South of this street is another, parallel to it, with a segmental frontispiece of superposed colonnades opening on the port.§ These two streets open at the east into the great place before the theatre, bounded at the north by an important building as yet unidentified, at the south by the agora and by the road leading to the Magnesian Gate, and on the east by the great theatre which cuts into the slope of the hill. The great agora is an open area about 525 feet square, surrounded with porticoes, and with a clock at the centre ; adjoining

\* This plan by Falkener is here reproduced in spite of its many inaccuracies and imaginative additions, because, in the absence of any other detailed plan of the site, it will serve to give us a general idea of the monumental qualities of the scheme. Some of the necessary corrections will be made in the text and notes.

† These two mountains, rightly identified by Falkener, were interchanged by Wood.

‡ These three structures are not accurately shown in detail by Falkener, and the court of Verulanus is called the "agora civilis."

§ Falkener's plan shows in the place of these two streets a winding Byzantine fortification wall, which must be eliminated from our conception of the ancient city.

it are smaller courts, one at the west with a colossal nymphaeum or fountain house,\* and one at the south with the beautiful library of Celsus. The road to the Magnesian gate, meanwhile, passes south along the east side of the agora, then turns eastward between some notable monuments, passing the odeum on the south slope of Mount Pion, and finally reaches the Magnesian Gate, inside which is another great gymnasium. On the north slope of Mount Pion lies the stadium, with a square court surrounding a circular building opposite its west end, and a monumental but unidentified structure at the north ; between the latter and the stadium runs a colonnaded road, with shops on either side, leading to the north-east gate.† From the latter, as from the Magnesian Gate, roads lead eastward and north-eastward to the temple of Artemis, distant respectively three-quarters and one and one-quarter miles.

The colonnaded street is a feature which was found not only in Greece and Asia Minor, but also throughout Syria ; the remains now existing belong however to the Roman period. But under the Seleucidae, from 300 to 167 b.c., the town of Antioch in Syria was laid out with wide colonnaded streets, crossing one another at right angles, the principal street, from east to west, being about two miles in length. The central avenue for carriage traffic was open to the sky ; the side avenues, bordered with shops and houses, had flat roofs over them. Similar protection from the fierce tropical sun was afforded in Greece by the porticoes round the market-places and in the temple enclosures.

The fortification walls surrounding the cities, hitherto constructed generally with a low socle of stone and a vast mass of sun-dried brick, now began to assume more permanent architectural form, as emphasis was laid on the decorative aspect of finely worked masonry. Thus the walls of Cnidus are built with large polygonal blocks fitting accurately together, with drafted edges round each block. As these walls have a substructure of regular squared masonry, it is obvious that they cannot be of the archaic period when polygonal stonework was likewise the fashion ; so that here the selection of this type of work (the idea of which may have been taken from earlier walls) would seem to have been due to the fact that the Greeks recognised its decorative value.

Among the important parts of the city were the agoras, which were of two kinds : firstly, those where the people assembled

\* The so-called "temple of Claudius," of the Corinthian order.

† Wood called this the Coressian Gate.

to hear the decisions of their rulers ; and secondly, the places of meeting for traffic and the transaction of public or private business. In both cases the agora consisted of a large open area, rectangular or trapezoidal, surrounded by colonnades or stoas. In the former case it was enriched with temples, fountains and statues ; and in the immediate vicinity of this agora were the bouleuterion or senate-house, the prytaneum or guest-house, and the basilica or hall of justice. The second type of agora had shops and stalls round it, and a fountain in the centre, unless, as at Elis, it served also for other purposes. From Pausanias's description we gather that the central space at Elis, known as the Hippodrome, was used for training horses ; on the south side was the umpire's hall, a porticus with four rows of columns which divided it into three aisles ; on the left was the umpire's residence, separated by a street from the agora ; on the right, similarly separated by a street from the agora, was a second porticus, the Stoa of the Corcyraeans, with a wall down the centre, against which stood on either side pedestals and statues and a colonnade ; and on the north or fourth side there was probably another colonnade. Many cities, especially those in Greece proper such as Corinth, had only a single agora in which all business was conducted. The architecture of the agora was of the simplest kind, and depended entirely for its effect on the ranges of columns which carried the roofs of these stoas, as is well illustrated in the restoration of the agora and stoas at Assos by Bacon and Koldewey (Fig. 76). Although the columns were in stone, the roofs they carried were always in wood, so that as the result of fires and earthquakes only the foundation walls have generally been found.

In some examples, as at Aegae and Alinda and Assos, the agoras were formed on the slopes of the hills, with artificial terraces to support them. The stoa along the outer side could then be erected in several storeys, the colonnade itself facing on the agora, and beneath it one or two storeys which were probably utilised as markets, though their primary object was the support of the terrace. In these Hellenic substructures we have some of the few examples of secular Greek architecture which are preserved to any considerable height, and they are of considerable interest as showing extreme simplicity of design with good solid construction. The example at Alinda (Fig. 77) is 332 feet long by 44 feet wide. On the lower storey is a corridor in the rear, 16 feet wide, giving

access to a series of rooms in the front, 16 feet deep, some of which were lighted by windows and others through doorways opening on to a terrace. The second or mezzanine storey consists of two long

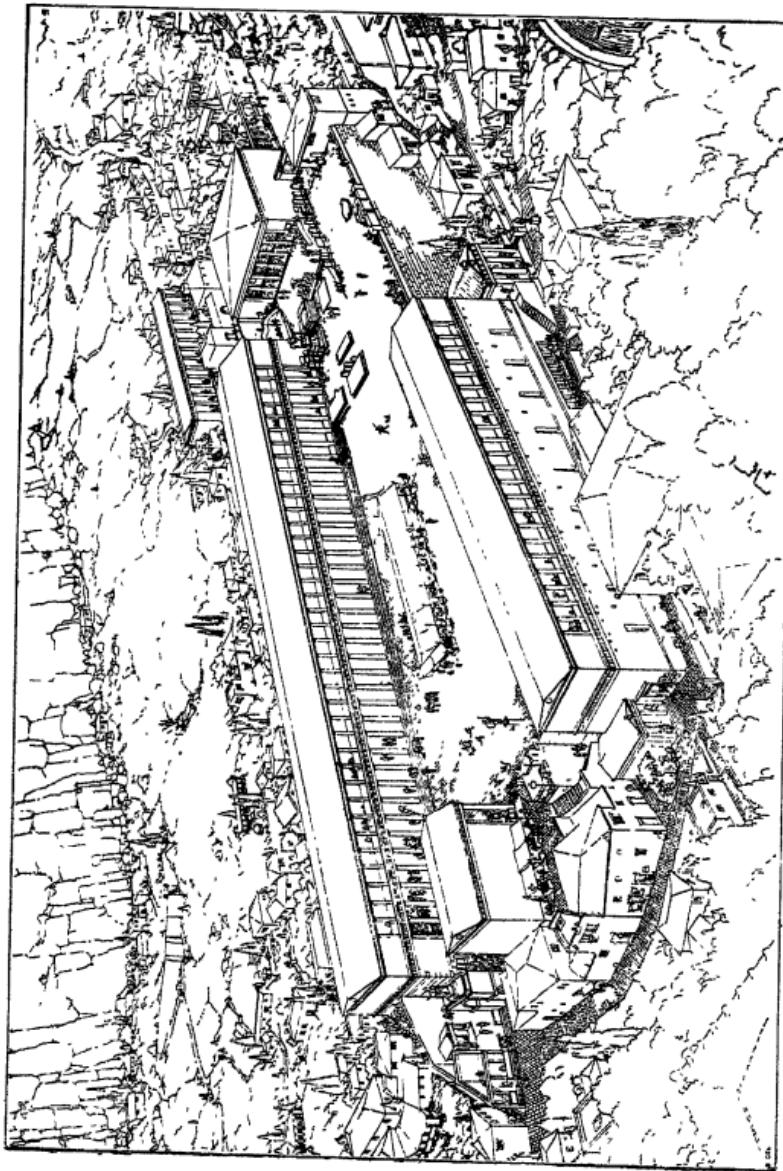


FIG. 76.—THE AGORA AT ASSOS. (Restored by Bacon)

corridors, divided by a series of piers with semi-detached Doric columns facing one another ; this storey was lighted only by narrow apertures at the top, in the front wall. The wooden floor dividing these two storeys has disappeared. All this was merely the substructure of the stoa proper : the front wall, 4 feet thick and 28 feet high, is built in coursed masonry, with nineteen courses varying in height apparently as the masons found the blocks to hand, the face of each being worked to a convex curve. The windows or smaller openings have deep architraves, the doorways voussoired arches ; and the whole is crowned by an ogee

string course. The stoa above this substructure had a row of columns down the centre to support the ridge beam, and on each side piers or pedestals with a solid stone parapet 5 feet high between ; all this latter portion is of Roman date. The terrace below the great basement is built on the natural rock, which was left unhewn. The example at Aegae was of similar design, with a front of 270 feet, and a return wing 89 feet long ; again it was three-storeyed, with two

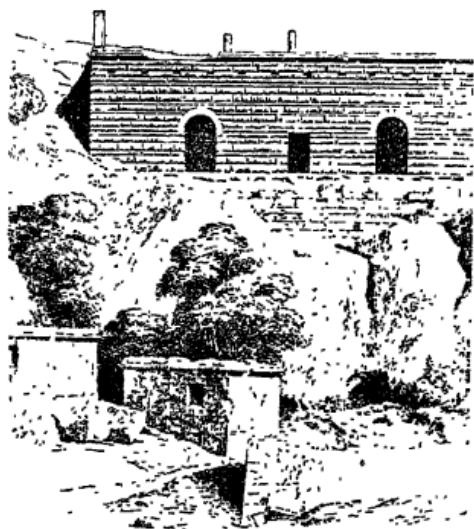


FIG. 77.—SUBSTRUCTURE OF STOA AT ALINDA.

storeys below the terrace level. It is true that these buildings were only substructures of porticos ; but in themselves they make a fine monumental effect, their architectural embellishment, if it may be called so, being confined to the varied heights of the courses of masonry and to their bossed surfaces. The Greeks apparently trusted to this finely-worked masonry alone for the external aspect of many of their buildings.

In many cases these stoas contained superposed colonnades, such as that built by Attalus II at Athens, with two storeys of columns, arranged in two aisles, with a row of shops at the back

(Fig. 78). The lower columns on the façade were Doric, the upper columns Ionic, the latter of elliptical plan in order to provide for the abutment of stone parapets between them, and supporting a mixed Doric-Ionic entablature; the interior capitals were of the Aeolic form (*cf.* Plate XXVI).

Among the buildings in the neighbourhood of the agora was, in Athens, the well-known Tower of the Winds, mentioned by Vitruvius as having been erected by Andronicus Cyrrhestes, the date probably being the beginning of the first century B.C. It is an octagonal tower of marble, 21 feet in diameter and 44 feet high (Plate LXIV), still well preserved and forming not only a beautiful feature but also one of the most characteristic buildings of Greece. On each side was sculptured a relief representing the wind blowing from the quarter facing it; the two figures best seen in the illustration represent, on the left, Sciron the north-west wind, emptying

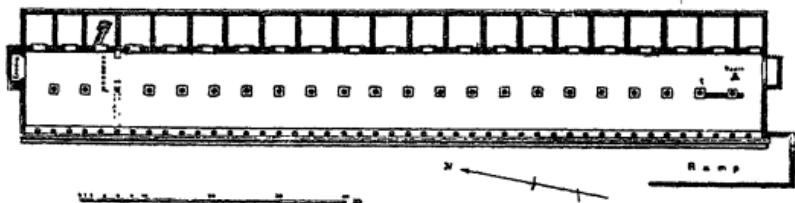


FIG. 78.—THE STOA OF ATTALUS AT ATHENS.

a wide-mouthed jar, and on the right Zephyrus the west wind, with his garment filled with spring flowers.

On the top of the roof was an octagonal Corinthian capital as a finial,\* supporting a huge bronze Triton working on a pivot, with a rod in his hand which pointed toward the figure representing the quarter in which the wind lay. Also on the faces of the tower were sun-dials, and inside was a water clock or clepsydra; the turret on the south side is supposed to have contained the cistern which supplied the water. There were two entrances, formed by two small distyle porches on two of the sides of the tower, now ruined, though the pieces lie in the neighbourhood. Most notable are their Corinthian capitals, of a special though not infrequent

\* The Turkish turban shown in Plate LXIV has now been removed and replaced by the original octagonal capital.

type ; the bell is decorated with a single row of acanthus leaves round the base, and with an upper row of water leaves, there being no volutes, while the abacus is perfectly square. Other examples of capitals of the same design were found during the excavation of the theatre of Dionysus.

The choragic monuments of the Hellenistic and Graeco-Roman periods were generally less pretentious than in the fourth century. Among the latest examples may be noted the isolated columns with triangular Corinthian capitals above the theatre at Athens (Plates III and LVII).

The theatre, during this period, passed through a considerable evolution, from the Greek to the Roman type. At first, in the Hellenistic examples, the action continued to take place upon the orchestra and the scene building formed merely the permanent

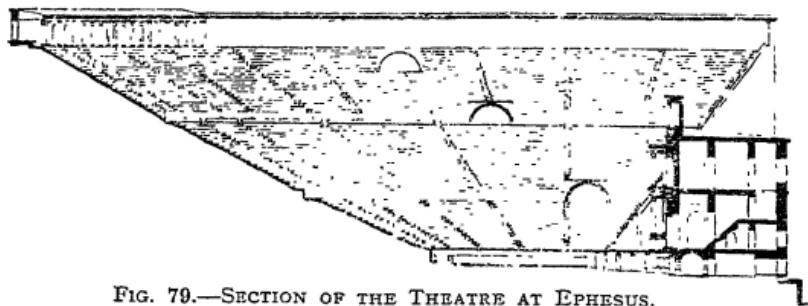


FIG. 79.—SECTION OF THE THEATRE AT EPHESUS.

scenery, though becoming more and more enriched (Plate LXIV). Of this type were the theatres at Ephesus (493 feet in diameter), Magnesia, Pergamum, Priene, and Assos. Gradually, however, the orchestra was taken over for other purposes during the Graeco-Roman period, and the action was driven back to a low stage, which now appeared for the first time. In the reconstructed theatre of Dionysus at Athens, as dating from the reign of Nero, the stage was about 5 feet high ; and the stone proscenium was in effect lifted to this level and thrust against the back wall of the scene, where it formed the lowest of several tiers of decorative colonnades, breaking forward and backward to form alternate niches and pavilions. Throughout Asia Minor the Graeco-Roman theatres now adopted this low stage and the colonnaded scene wall, which became an important architectural feature ; or we even find the high stage, as at Ephesus (Plate LXV ; Fig. 79). At Aezani



THE TOWER OF THE WINDS, ATHENS.



VIEW IN THE THEATRE AT PRIENE.



VIEW IN THE THEATRE AT EPHESUS.



THE HOUSE OF CLEOPATRA AT DELOS.

the plan is transitional between the Greek and the Roman theatre, the auditorium being horseshoe in form, and there being no junction between the walls of the auditorium and the scene buildings ; the external diameter was 380 feet. The depth of the stage was 20 feet, and the back wall was decorated with a series of columns standing 6 feet from the wall and carrying a second tier of columns, the lower storey being of the composite order, and the upper Corinthian ; these columns were arranged in pairs, with doorways between them, the central doorway being flanked by columns of greater size. More developed and in better preservation was the theatre at Aspendus, built by the architect Zeno in the reign of Antoninus Pius (138-161 A.D.). The auditorium had two ranges of seats, twenty-one in the lower and eighteen in the upper, and even retained an arcaded gallery running round the theatre at the top. The back wall of the scene, with the three doorways leading to the stage, still retained its tiers of entablatures and pediments ; only the columns were missing ; the stage was roofed, above the two colonnaded storeys, by means of cantilever trusses rising from back to front. The exterior of the rear wall at Aspendus, 80 feet in height and 360 feet in length, has no other architectural embellishment than that of its drafted and rusticated masonry in courses of varying heights, showing the simplicity of treatment which lasted in Asia Minor even down to Roman times, the only Roman elements to creep in being the moulded archivolts of the range of arches in the upper portion of the wall. Other examples in Asia Minor are found at Aegae, Alinda, Hierapolis, Laodicea-ad-Lycum, Myra, Patara, Perga, Pinara, Side, Telmessus, Termessus, and Tralles, as well as at Segesta, Syracuse, and Taormina in Sicily.

An example of the Graeco-Roman type of *odeum* is that of Herodes Atticus at Athens, erected on the south slope of the Acropolis at about 161 A.D. Like the neighbouring theatre of Dionysus, it is partly hewn out of the rock ; and it still preserves its outer walls to a considerable height, and some of the marble seats. The plan is merely that of the ordinary Graeco-Roman theatre, but is slightly smaller in size ; the auditorium had a diameter of 250 feet. It is said to have been roofed with cedar wood ; and, though this statement might perhaps be regarded as an allusion to the roof over the stage alone, it does not seem probable that such a feature of ordinary occurrence would have been stressed by an ancient writer ; nor does it seem physically possible

to have covered the entire area without internal supports, of which there is no evidence. Possibly the roof covered merely the seats, even so having tremendous spans effected with counter-levered trusses and chains, leaving the central portion to be temporarily covered with an awning.

The stadium retained in later times the form which it had assumed in the fourth century, the most important in the period now under discussion being those which were erected in Asia Minor. The Stadium at Ephesus was 800 feet long, cut in the hill on one side and enclosed with masonry on the other ; it will be noticed that an additional tier of seats was built on the hillside (Fig. 75), which had incidentally the result of giving a more monumental appearance to those who entered the town through the north-east gate, though its real purpose, as shown in other examples, was to take advantage of the natural slope on one side and to economise in the amount of artificial embankment required on the other. At Aezani, Magnesia, and Perga the stadia were built on level ground, more in the Roman manner ; in the last of these a colonnaded gallery 770 feet long was carried round above the seats. The largest stadium, but built in Roman times, was that at Laodicea-ad-Lycum, which was 1,000 feet long, with semi-circular terminations at each end ; a similar arrangement with semi-circular colonnades at each end existed at Aphrodisias.

The gymnasium now assumed a more formal plan than that of the fourth century. The gymnasium proper was the open athletic ground for running, jumping, and throwing, while the name palaestra was given to the enclosed structures wherein wrestling and the like were practised. The palaestra at Olympia (Plate XXIV PA) consisted of a large open court with a Doric peristyle round it, and, on all four sides, a series of rooms for exercise under cover, dressing rooms, baths, etc. ; of similar form was the palaestra at Epidaurus (Fig. 80), and with such works Vitruvius's description agrees fairly well. Of the great gymnasium at Olympia (Plate XXIV G), which must have been an establishment of considerable importance, the great double-aisled porticus (660 feet long) on the east side alone has been excavated. The later gymnasia would appear to have been the prototypes of the Roman thermae, except that they were built for gymnastic exercises of various kinds, the baths being subordinated. Thus the so-called "gymnasium" at Alexandria Troas is in reality a bath, which in actual date is Roman

(about 150 A.D.), showing the axial composition in a rectangular block and the great vaulted halls which are characteristic of the Roman thermae; but in details it is far more closely related to the Greek gymnasium than to the Roman thermae, the principal hall containing a series of shower baths corresponding to those in the far earlier gymnasium at Delphi. But other baths, as at Ephesus, Corinth, etc., are of a more developed type rivalling in magnificence the Roman thermae and showing a very great departure from the gymnasium plan.\*

In all the earlier classical periods, in contrast to the feeling in prehistoric times, the dwelling houses of the Greeks, even those of the wealthy, seem to have been unpretentious fabrics. Viewed from without, they were of a simple nature, being designed only to shut out "the noise and rattle of the town," the chambers facing inwards towards courtyards, and, in the more important houses, on peristyles. It must be remembered that the Greeks

of every period spent their time mostly in the open air and in their places of public assembly, and that their climate failed to develop the home as a place of social intercourse. The writings of the various authors suggest that the ordinary Greek house was simply a residence to which the master of the house returned from his vocation in the city to take his meals and sleep, and that during the

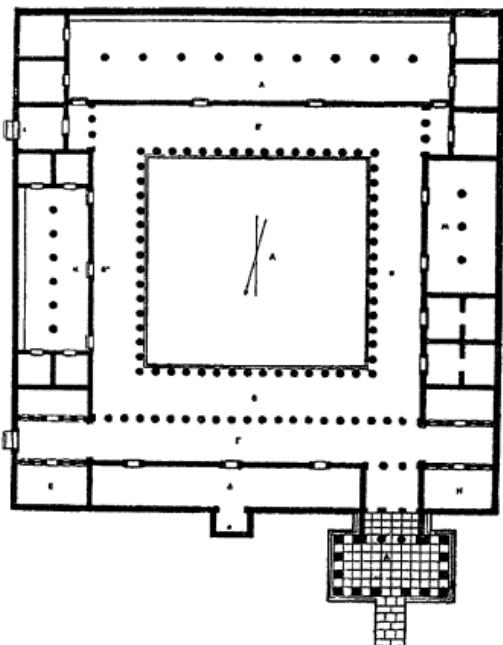


FIG. 80.—THE PALAESTRA AT EPIDAURUS.

\* The monumental Roman buildings at Ephesus identified by Falkener and Wood as the gymnasia of the theatre and stadium are not sufficiently explored to permit a description, and probably they were intended for very different purposes.

daytime it was left in the care of the chief matron of the establishment. It was not until the Hellenistic and Graeco-Roman periods that the houses began to receive the attention commensurate with that hitherto bestowed on other types of buildings. The house seems generally to have been of one storey, with walls of unburnt brick on a stone foundation; windows were absent, and the door opened on a comparatively narrow street. The examples discovered at Priene and Delos (Figs. 81, 82) are of very simple character, the usual features being a narrow entrance (D), a single courtyard (A), with an exedra (B), facing the sun and sheltered from the winds,\* and one large room (C) provided for feasts, and with smaller rooms and offices round the court and lighted

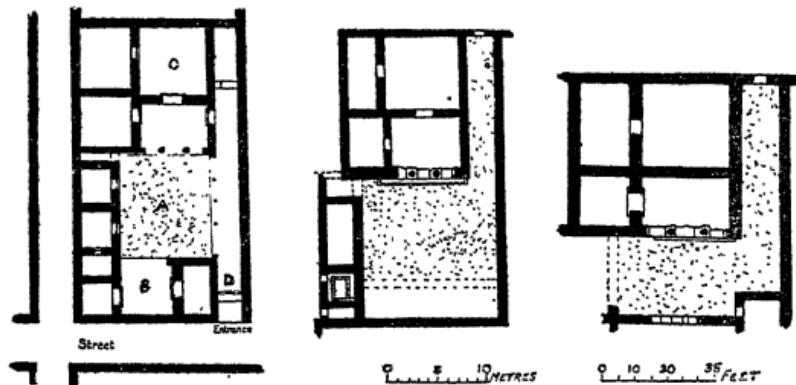


FIG. 81.—HOUSES AT PRIENE.

from it. In the more important houses found in Priene and Delos a peristyle is carried round two, three, or eventually four sides of the courtyard. The earlier examples, as those of the third century at Priene (Fig. 81), still show the survival of the megaron type which underlies the temple plan, a type which had been developed by the Achaean and Dorian invaders of Greece; but in the second century, as at Delos (Fig. 82), the predominating type was the oriental peristyle, often very graceful with its slender marble columns (Plate LXV), and giving almost the effect of the Roman atrium. The first portion of the description of the Greek house given by Vitruvius is in accordance with the remains of these later

\* Figs. 81 and 82 are oriented with north at the top.

houses, with the peristyle and the narrow passage leading from the street, flanked by the doorkeeper's rooms on one side and the stables on the other. The second portion of Vitruvius's description applies to the more luxurious additions which crept in at a later period, examples of which we find at Pompeii, but it becomes necessary to reverse the order he gives ; in other words, that which Vitruvius calls the gynaeconitis, or women's quarter, should be

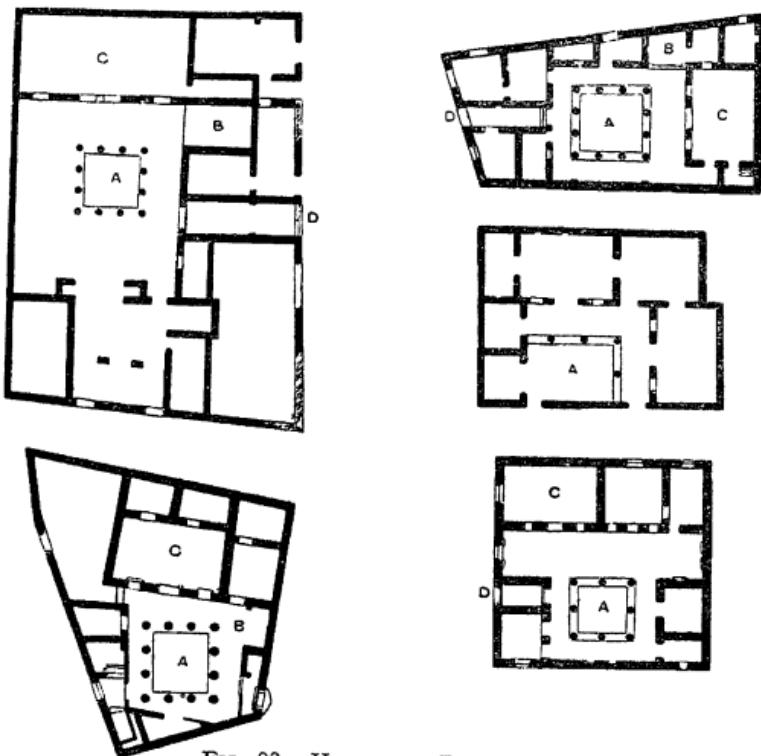


FIG. 82.—HOUSES AT DELOS.

transferred to the rear, and the atrium with its sumptuous approach, and the exedra, tablinum, triclinium, and other halls, become the guest chambers where the master of the house received his clients and supporters and entertained his guests.

An example of a residence on a more magnificent scale, a summer palace near Palatizza, in Macedonia, was discovered by Heuzey and Daumet (Fig. 83). The principal front of the palace, which faced east, measured about 250 feet ; at the centre was a

spacious entrance, and on either side were deep open porticoes of the Doric order. The entrance was subdivided into three aisles by two rows of Ionic columns similar to those found in the Propylaea at Athens and Eleusis, and beyond was an open anteroom, with various halls to the right and left, and in front a hall of audience, which was once richly decorated with marbles. Passing through this, one entered an immense court, about 200 feet wide, which was surrounded by a peristyle giving access on the north and south to various chambers, and on either side of the hall of audience to two great halls. The hall on the left or south side, which was circular, with a diameter of 36 feet, was decorated with marble, and in it the foundations of an altar or throne were found ; this may have been the prytaneum, originally the house or hall of the king

or chief magistrate, where the foreign envoys or distinguished statesmen or generals were received and entertained. On the north side was a corresponding hall, but square, apparently forming a state dining-room ; it opened on to a court farther north, and beyond this, in the north wing of the

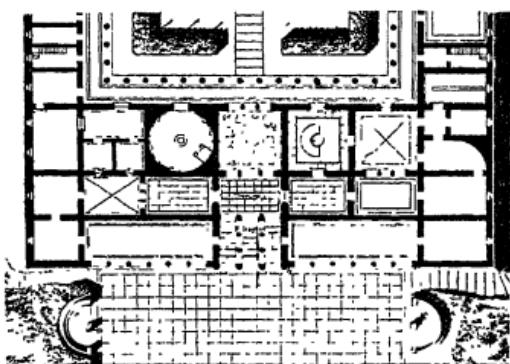


FIG. 83.—PORTION OF THE PALACE AT PALATITZA.  
(Restored by Daumet)

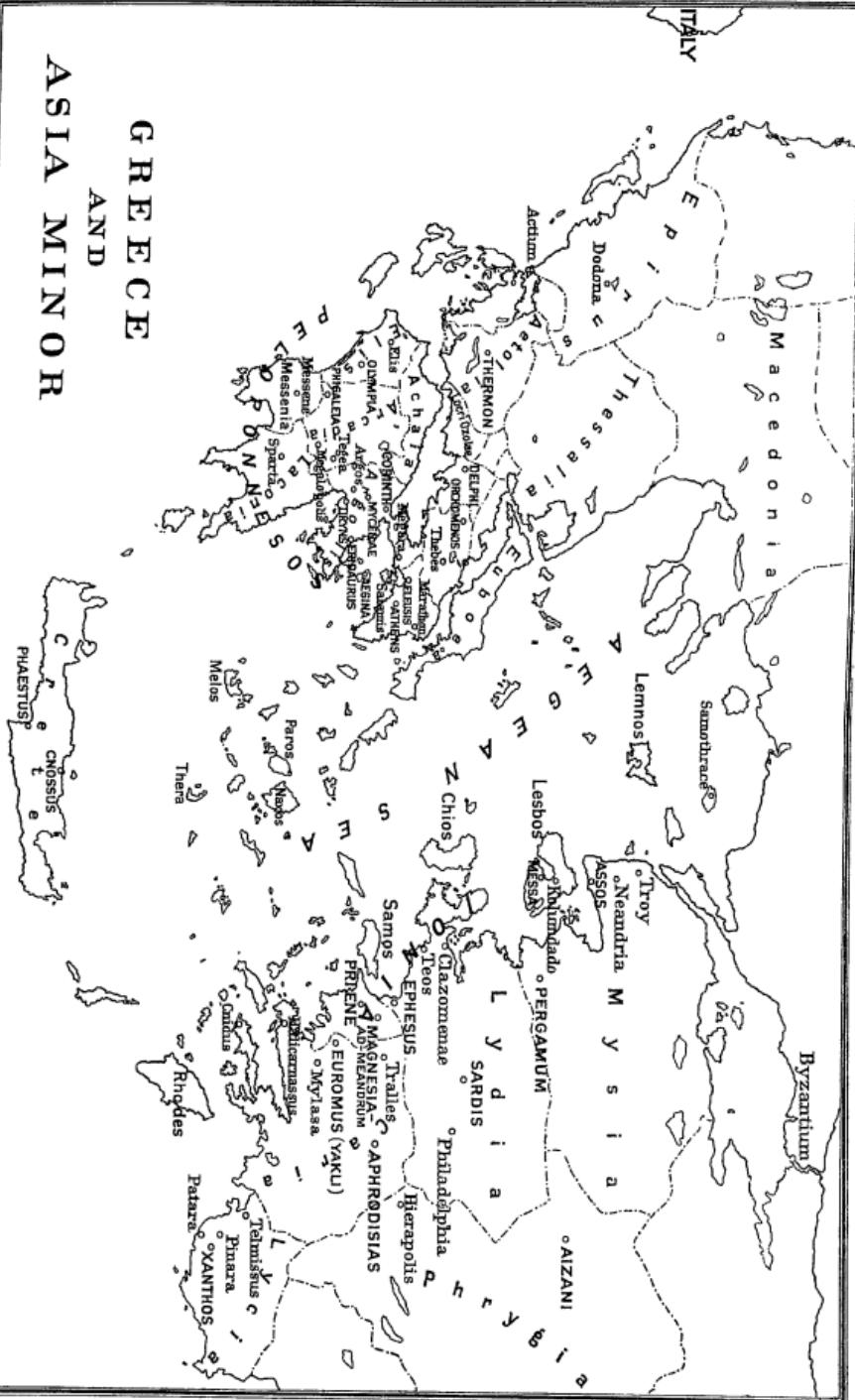
building, lay the offices, kitchen, etc. To the south of the circular hall, on the other hand, were the private apartments of the king.

The simple and unpretentious character of Greek domestic architecture as a whole, then, is due to the fact that the Greeks would seem to have lavished their taste and skill on their public buildings, and it is of the latter that we speak, as a rule, when describing the architecture of Greece. These we have now passed in review, the temples, altars, treasuries, stoas, and votive monuments enclosed within the sacred precincts, and also the agora with its colonnades or peristyles, the bouleuterion and the theatre, the odeum and the stadium, the palaestra and the gymnasium. For the further developments of classical architecture it is necessary to turn to that of imperial Rome.





G R E E C E  
A N D  
A S I A M I N O R





**CHRONOLOGICAL LIST  
OF GREEK TEMPLES**



CHRONOLOGICAL LIST OF GREEK TEMPLES<sup>1</sup>  
GIVING THEIR APPROXIMATE DATES AND PRINCIPAL DIMENSIONS AND PROPORTIONS

Date <sup>2</sup>	Name of Temple	No. of Columns	Top of Stylobate	Diameter of Column	No. of Plates	Height of Column	Height of Entablature <sup>3</sup>	Proportions in Lower Diameters			
								Front ft. m.	Flank ft. m.	Lower ft. in.	Upper ft. in.
DORIC											
c. 650	Olympia, Heraeum	6	16	61 7	184 1	{ 3 3½	{ 16 2½	16, 20	17 1½	?	?
c. 590	Syracuse, Apollo	6	17 (?)	50 5	180 5 <sup>3</sup>	{ 6 3	{ 4 6	16	26 3	?	1.06, 0.76
c. 580	Syracuse, Olympieum	6	17	73 7	205 5	{ 6 4	{ 6 8	16	?	?	1.23, 1.03
c. 570	Selinus, "C"	6	17	78 6	209 2	{ 6 3	{ ?	16, 20	28 2½	14 8	1.50, 1.13
c. 560	Selinus, "D"	6	13	77 7	183 7	{ 5 6	{ 3 10½	20	27 5	13 0	1.62, 1.70
c. 540	Selinus, "PS"	6	14	89 2	206 10	{ 5 11½	{ 4 1	20	29 10½	13 0	1.45, 1.63
	Pæstum, Basilica	9	18	80 6	177 11	{ 4 9½	{ 3 2	20	21 3	?	0.96, 1.12
	Acos, Athenea	6	13	46 0	99 5	{ 3 0	{ 2 1	16	15 8	6 7½	1.86, 1.68
	Corinth, Apollo	6	15	70 7	176 7	{ 5 5½	{ ?	20	23 9½	?	1.31, 1.28
c. 530	Selinus, "GT" 4.	8	17	184 4	362 1	{ 9 6	{ 5 5½	20	33 4	21 10	1.25, 1.38
	Acragas, Zeus Olympios	7	17	178 5	360 11	{ 14 1	{ 10 2	20	33 0	26 7½	0.88, 0.89
c. 527	Athens, Athenea	6	12	70 0	142 6	{ c. 5 5	{ 4 3	20	?	11 1½	c. 1.45, 1.47
c. 520	Pæstum, Demeter	6	13	47 8	107 10	{ 4 1	{ 2 9	20	10 9	9 1	1.10
	Metapontum, Tavole Paladine	4	12	52 8	109 7	{ 3 6	{ 2 6	20	16 10	?	1.76
c. 515	Delphi, Athenian Treasury	2	int-antis	21 6	31 9	{ 2 8	{ 1 10½	20	13 6½	c. 5 5	1.87
c. 510	Acragas, Hieraclea	6	15	85 1	218 10	{ 6 10	{ 4 11½	20	33 0½	12 2	1.22
c. 500	Selinus, "ER"	6	15	83 1	226 2	{ 7 6	{ 5 10	20	33 2	14 8	1.07
c. 490	Selinus, "A"	6	14	53 3	132 1	{ 4 6	{ 3 5½	20	23 6	9 1	1.37
c. 480	Aegina, Aphrodite	6	12	45 3	94 7	{ 3 3	{ 2 5	20	17 3½	6 7	1.85, 1.59
	Athens, Older Parthenon	6	17	77 2	210 5	{ 6 3	{ ?	20	?	?	1.33, 1.29
c. 485	Syracuse, Athens	6	14	72 2	180 4	{ 6 3½	{ 5 0	20	28 1	?	?
c. 465	Olympia, Zeus	6	13	90 10	210 4	{ 7 4½	{ 6 7½	20	34 2½	13 8	1.32, 1.35
c. 440	Pæstum, Poseidon	6	14	70 7	106 10	{ 7 3	{ 6 5	20	30 2	12 6	1.16, 1.17
	Acragas, Hera Lacinia	6	13	55 6	125 2	{ 4 7½	{ 3 6	20	21 1	?	1.19
c. 440	Bassae, Apollo	6	15	47 7	125 4	{ 3 7	{ 2 10½	20	19 5	6 6½	1.90, 1.45
c. 447	Athens, Parthenon	8	17	101 2½	226 0	{ 6 3	{ 4 10½	20	34 3	10 9½	5.48
c. 440	Acragates, Concord	6	13	55 6	120 5	{ 4 7½	{ 3 9	20	23 1	9 8	1.73
437	Athens, Propylaea—Central Building	6	prostyle	69 4	—	{ 5 1½	{ 3 11½	20	27 11½	8 11	1.33
	West Wings	6	int-antis	—	—	{ 3 6½	{ 2 9	20	19 2	6 3	1.33
c. 435	Rhamnus, Nemesis	6	9	32 9	70 2	{ 2 4	{ 1 9½	20	13 6½	4 6½	1.66
c. 430	Sagena	6	14	76 3	190 7	{ 6 5	{ 5 1½	—	30 0	11 9	1.22
423	Argos, Hera	6	12	56 9	121 0	{ 4 4	{ 3 3½	20	24 2	?	1.47
	Simium, Poseidon	6	13	44 2	102 1	{ 3 5½	{ 2 8	16	10 9½	6 7½	1.41
421	Athens, Theseum	6	13	45 6	104 2	{ 3 6½	{ 2 6½	20	18 9	6 7½	1.57
c. 380	Epidauros, Asclepius	6	11	29 8	75 11	{ 3 0	{ 2 5	20	?	6 0	c. 1.49
c. 375	Delphi, Apollo	6	15	72 1	190 11	{ 3 11	{ 4 6½	20	34 9	?	1.29, 1.26
c. 360	Trepsi, Athena Alea	6	14	62 10	186 11	{ 6 1	{ 3 11½	20	31 1	8 4½	1.33, 1.32
c. 330	Nemæ, Zeus	6	12	63 11	136 7	{ 6 4½	{ 4 8½	20	34 0½	8 1	1.50
321	Straton, Zeus	6	11	54 6	120 4	{ 4 2½	{ 3 7½	20	25 9	6 7½	c. 5.99
c. 320	Olympia, Metron	6	11	34 10	67 10	{ 2 9½	{ 2 5½	20	?	4 10½	1.38
319	Athens, Nicia Monument	6	prostyle	36 1	49 10	{ 2 9	{ 2 2½	20	16 9	9 9½	1.59
c. 300	Pergamum, Athena Polias	6	10	49 3	71 5	{ 2 6	{ 2 0	20	17 3	6 0	6.09
c. 290	Pergamum, Dionysos	4	prostyle	22 0	38 9	{ 2 0½	{ 1 8½	20	14 8½	2 9½	2.98
c. 180 <b>a.d.</b>	Eleusis, Artemis Propylaæ	4	amphiprostyle	21 2	40 6	{ 2 7	{ 2 0½	20	14 10½	4 7½	5.76
IONIC											
c. 560	Ephesus, Artemis (old)	8 (9)	21	180 3	365 10	{ 5 5½	{ 4 5	48, 44	?	?	c. 4.25 to 4.45
c. 555	Samos, Hera	8 (9)	24	180 2	365 0	{ 4 11½	{ 3 11	20	?	?	c. 4.14 to 4.62
c. 448	Athens, Ilissus	4	amphiprostyle	19 6	41 7	{ 1 9½	{ 1 6½	24	14 8½	3 7½	8.25
c. 426	Athens, Athena Nike	4	amphiprostyle	17 8	26 9	{ 1 8½	{ 1 5	24	13 3½	3 4½	7.85
c. 421	Athens, Erechtheum	4	prostyle	35 2	—	{ 2 8	{ 2 4	24	25 1½	5 6	2.85, 2.35
	North Porico	4	int-antis	38 2	—	{ 2 3½	{ 1 11½	24	21 7½	4 11½	2.05
	East Porico	6	int-antis	38 2	—	{ 3 7½	{ 2 7½	24	21 7½	4 11½	2.18
c. 356	Ephesus, Artemis (new)	8 (9)	21	180 3	365 10	{ 6 0½	{ 4 9½	c. 57 6	?	?	c. 5.90
	Sardis, Artemis-Cybele	8	29	155 10	331 8	{ 6 6	{ 5 7	24	56 5	?	2.66 to 1.02
353	Halicarnassus, Mausoleum	9	11	c. 86 4	c. 106 9	{ 3 9½	{ 3 0½	24	32 9	8 0	1.80
c. 340	Priene, Athena Polias	6	11	64 2	122 0	{ 4 2½	{ 3 8	24	37 10½	5 7	1.78
c. 334	Didyma, Apollo	10	21	167 9	338 11	{ 6 6	{ 6 3½	24	63 8	?	1.67
c. 280	Meteora	8	14	72 10	131 2	{ 3 5	{ 2 9½	24	?	7 9	1.85
c. 260	Sounion, Apollo	8	14	74 1	132 8	{ 3 10½	{ 3 3½	24	?	7 5	1.62
c. 160	Magnesia, Artemis Lenoxiphryne	8	15	102 6	188 8	{ 4 7½	{ 4 0	24	?	8 34	1.81
	Troë, Dionysos	6	11	61 1	114 9	{ 3 4½	{ 2 10½	24	c. 31 3	6 2	2.17
c. 125 <b>a.d.</b>	Aphrodite, Aphrodite	8	13	c. 65 5	c. 106 10	{ 3 8	{ 3 1	24	30 6½	?	1.50
	Arcæni, Zeus	8	15	70 8	121 1	{ 3 2	{ 2 10½	24	31 6	5 1	1.63
CORINTHIAN											
174	Athens, Zeus Olympios	8	20	135 1	334 1	{ 6 3½	{ 6 4½	24	55 5	?	1.80, 1.88
c. 140 <b>a.d.</b>	Sagalassos, Antoninus Plus	6	11	45 6	87 5	{ 2 7	{ 2 4	24	?	5 0	2.20
	Euromus	6	11	c. 47 2	c. 99 1	{ 2 10½	{ 2 5½	24	21 3	5 64	2.00
	Cnidus	4	8	28 4	48 0	{ 2 1	{ 1 10	20	4 0	2.73, 2.09	?

<sup>1</sup> Including for comparison a few other accurately dated buildings, the Athenian Treasury at Delphi, the Propylaea and the Monument of Nicias at Athens, and the Mausoleum at Halicarnassus.

<sup>2</sup> All dates are n.c. unless otherwise stated.

<sup>3</sup> The height of the entablature is always measured to the top of the cornice, omitting the sum which forms in reality part of the roof.

<sup>4</sup> In temple "GT" at Selinus the lower diameter in the third period was 10 ft. 10 in., the upper diameter 6 ft. 11½ in. in the second period and 7 ft. 7 in. in the third. The intercolumniation in the third period (west facade) was 1.01 diameters, the height of the column 4 ft. 9½ diameters, the height of the entablature 2.15 diameters.



## SELECTED BIBLIOGRAPHY

### GENERAL WORKS

#### PRE-CLASSICAL AND CLASSICAL PERIODS TOGETHER

- ARCHITECTURAL PUBLICATION SOCIETY.—Dictionary of Architecture. 6 vols. London, 1848-94.
- BAEDEKER (K.).—Greece: Handbook for Travellers. 4th ed., Leipzig, 1909.  
——— Konstantinopel und Kleinasien. 2nd ed., Leipzig, 1914.
- BAUD-BOVY (D.) and BOISSONNAS (F.).—En Grèce par Monts et par Vaux. Geneva, 1910. (Also English trans.)  
——— Des Cyclades en Crète au Gré du Vent. Geneva, 1919.
- BAUMEISTER (A.).—Denkmäler des klassischen Altertums. 3 vols. Munich and Leipzig, 1885-88.
- BENOIT (F.).—L'Architecture: I, Antiquité. Paris, 1911.
- BORRMANN (R.) and NEUWIRTH (J.).—Geschichte der Baukunst: I, Die Baukunst des Altertums. Leipzig, 1904.
- CHOISY (A.).—Histoire de l'Architecture. Vol. I. Paris, 1899.
- DAREMBERG (C.) and SAGLIO (E.).—Dictionnaire des Antiquités grecques et romaines. 6 vols. Paris, 1873-1919.
- DUCATI (P.).—L'Arte Classica. Turin, 1920.
- DURM (J.).—Handbuch der Architektur: Die Baukunst der Griechen. 3rd ed., Leipzig, 1910.
- FLETCHER (Sir B.).—History of Architecture. London, 1924.
- FOUGÈRES (G.).—Grèce (Guides Bleus). Paris, 1911.
- FOWLER (H. N.) and WHEELER (J. R.).—Handbook of Greek Archaeology. New York and Cincinnati, 1909.
- FRAZER (Sir J. G.).—Pausanias's Description of Greece. 6 vols. London, 1898. (Reprinted 1913.)
- HAMLIN (A. D. F.).—Text Book of the History of Architecture. New ed., New York, 1923.
- KIMBALL (F.) and EDGELL (G.).—History of Architecture. New York and London, 1918.
- LALOUX (V.).—L'Architecture grecque. Paris, 1888.
- LEROUX (G.).—Les Origines de l'Edifice hypostyle en Grèce, en Orient, et chez les Romains. Paris, 1913.
- LONGFELLOW (W. P. P.).—Cyclopaedia of Architecture in Italy, Greece, and the Levant. New York, 1895.
- MARSHALL (F. H.).—Discovery in Greek Lands: A Sketch of the Principal Excavations and Discoveries of the Last Fifty Years. Cambridge, 1920.
- MICHAELIS (A.).—Century of Archaeological Discoveries. New York and London, 1908.
- NOACK (F.).—Die Baukunst des Altertums. Berlin, 1910.
- PAULY (A.) and WISSOWA (G.).—Real-Encyclopädie der classischen Altertumswissenschaft. New ed., Stuttgart, 1894 (in progress).

PAUSANIAS.—*See* FRAZER.

RICHTER (G. M. A.).—Metropolitan Museum of Art: Handbook of the Classical Collection. New York, 1917. (Reprinted 1921.)

RIZZO (G. E.).—Storia dell' Arte Greca. Turin, 1914- (in progress)

SIMPSON (F. M.).—History of Architectural Development Vol. I. London, 1905

SMITH (Sir W.)—Dictionary of Greek and Roman Antiquities. 2 vols. London, 1895.

SPRINGER (A.) and WOLTERS (P.).—Handbuch der Kunstgeschichte · 1, Die Kunst des Altertums. 12th ed., Leipzig, 1923

STURGIS (R.)—Dictionary of Architecture and Building. 3 vols. New York, 1901

——— History of Architecture Vol. I. New York, 1906.

TARBELL (F. B.).—History of Greek Art. Meadville and New York, 1896.

WALTERS (H. B.).—The Art of the Greeks. New York and London, 1906.

WARREN (H. L.).—The Foundations of Classic Architecture. New York, 1919.

WHIBLEY (L.).—Companion to Greek Studies. 3rd ed., Cambridge, 1916

### THE AEGEAN AGE

#### CHAPTER I.

ATKINSON (T. D.) and others.—Excavations at Phylakopi in Melos (Suppl. Papers Soc. Prom. Hellenic Studies, IV). London, 1904.

BAIKIE (J.).—The Sea-Kings of Crete. 3rd ed., London, 1920.

BASSETT (S. E.).—The Palace of Odysseus. (In *A. J. A.*, XXIII, 1919)

BELGER (C.).—Beiträge zur Kenntniss der griechischen Kuppelgräber. Berlin, 1887.

BELL (E.).—Prehellenic Architecture in the Aegean. London, 1926.

BLEGEN (C. W.).—Korakou, a Prehistoric Settlement near Corinth. Boston and New York, 1921.

BOETHIUS (C. A.).—Mycenaean Megara and Nordic Houses. (In *B. S. A.*, XXIV, 1919/21).

BOSSELT (H. T.).—Alt Kreta. 2nd ed., Berlin, 1923.

BULLE (H.).—Orchomenos. (In *Abh. Mün. Akad.*, XXIV, 1907.)

BURROWS (R. M.).—The Discoveries in Crete. 2nd ed., London, 1908.

DEUTSCHES ARCHAEOLOGISCHES INSTITUT.—Tiryns: Die Ergebnisse der Ausgrabungen. Athens, 1912- (in progress).

DÖRPFELD (W.).—Briefe über Leukas-Ithaka. Athens, 1905-11.

——— Kretische, Mykenische, und Homerische Paläste (In *Ath. Mitt.*, XXX and XXXII, 1905 and 1907.)

DÖRPFELD (W.) and others.—Troja und Ilion. 2 vols. Athens, 1902.

DURM (J.).—Über Vormykenische und Mykenische Architekturformen. (In *Jahresh. Oest. Arch. Inst.*, X, 1907.)

DUSSAUD (R.).—Les Civilisations pré-helléniques dans le Bassin de la Mer Égée. 2nd ed., Paris, 1914.

EVANS (Sir A. J.).—Bird's-eye View of the Minoan Palace of Knossos, Crete. (In *Journal R. I. B. A.*, X, 1902 3.)

——— The Palace of Knossos. (In *B.S.A.*, VI-XI, 1900/1-1904/5.)

——— The Palace of Minos at Knossos. London, 1921- (in progress).

——— Prehistoric Tombs of Knossos. (In *Archaeologia*, LIX, 1905.)

- FIMMEN (D.).—Die Kretisch-Mykenische Kultur. Leipzig and Berlin, 1921.
- GLASGOW (G.).—The Minoans. London, 1923.
- HALL (H. R.).—Aegean Archaeology. London, 1915.
- HAWES (H. B.) and others.—Gournia, Vasiliki, and other Prehistoric Sites on the Isthmus of Hierapetra, Crete. Philadelphia, 1908.
- HOLLAND (L. B.).—Primitive Aegean Roofs. (In *A.J.A.*, XXIV, 1920.)
- ISHAM (N. M.).—The Homeric Palace. Providence, 1898.
- KARO (G.).—Führer durch die Ruinen von Tiryns. Athens, 1915.
- LICHTENBERG (R. von).—Die Ágaische Kultur. Leipzig, 1918.
- LOLLING (H.) and BOHN (R.).—Das Kuppelgrab bei Menidi. Athens, 1880.
- MACKENZIE (D.).—Cretan Palaces and the Aegean Civilisation. (In *B.S.A.*, XI-XIV, 1904/5-1907/8.)
- MARAGHIANNIS (G.) and others.—Antiquités Cretoises. 3 vols. Candia and Athens, 1912-15.
- MEURER (M.).—Form und Herkunft der Mykenischen Säule. (In *Jahrb. Arch. Inst.*, XXIX, 1914.)
- MOSO (A.).—The Palaces of Crete and their Builders. 2nd ed., London, 1910.
- NOACK (F.).—Arne. (In *Ath. Mitt.*, XIX, 1894.)
- Homerische Palaste. Leipzig, 1903.
- Ovalhaus und Palast in Kreta. Leipzig, 1908.
- PERNIER (L.).—Scavi della Missione Italiana a Phaestos. (In *Mon. Ant.*, XII and XIV, 1902 and 1904.)
- PERROT (G.) and CHIPIEZ (C.).—Histoire de l'Art dans l'Antiquité : VI, La Grèce primitive, l'Art Mycenien. Paris, 1894.
- REBER (F. von).—Über das Verhältnis des Mykenischen zum Dorischen Baustil. (In *Abh. Mun. Akad.*, XXI, 1898.)
- RIDDER (A. DE).—Fouilles de Gha. (In *B.C.H.*, XVIII, 1894.)
- RODENWALDT (G.).—Der Fries des Megarons von Mykenai. Halle, 1921.
- SCHLIEMANN (H.).—Troy and its Remains. London, 1875.
- Ilios : the City and Country of the Trojans. London, 1880.
- Mycenae : a Narrative of Researches and Discoveries at Mycenae and Tiryns. New York, 1880.
- Orchomenos. Leipzig, 1881.
- Troja : Results of the Latest Researches and Discoveries on the Site of Homer's Troy. London, 1884.
- Tiryns : the Prehistoric Palace of the Kings of Tiryns. London, 1886.
- SIMPSON (W.).—Notes upon the Smaller "Treasures" at Mycenae. (In *Journal R.I.B.A.*, II, 1894/5.)
- THIERSCH (F.).—Die Tholos des Atreus zu Mykenae. (In *Ath. Mitt.*, IV, 1879.)
- TSOUNTAS (C.) and MANATT (J. I.).—The Mycenaean Age. London, 1897.
- WACE (A. J. B.) and others.—Excavations at Mycenae. (In *B.S.A.*, XXIV-XXV, 1919/21-1921/23.)
- WACE (A. J. B.) and THOMPSON (M. S.).—Prehistoric Thessaly. Cambridge, 1912.
- WURZ (E.).—Der Ursprung der Kretisch-Mykenischen Säulen. Munich, 1913.

## THE CLASSICAL PERIODS IN GENERAL

## CHAPTERS II TO VII

- BELL (E.).—Hellenic Architecture, its Genesis and Growth. London, 1920.
- BUHLMANN (J.).—The Architecture of Classical Antiquity and of the Renaissance. Berlin, 1892.
- CARPENTER (R.).—The Esthetic Basis of Greek Art. Bryn Mawr and New York, 1921.
- CHOISY (A.).—Vitruve. 4 vols. Paris, 1909.
- DÖRPFELD (W.).—Die Beleuchtung der Griechischen Tempel. (In *Zeitschr. Gesch. d. Architektur*, VI, 1913.)
- DURM (J.).—Constructive und Polychrome Details der Griechischen Baukunst. Berlin, 1880.
- ESPOUY (H. d').—Fragments d'Architecture antique. 2 vols. Paris, 1896, 1905.
- Monuments antiques Relevés et Restaurés par les Architectes Pensionnaires de l'Academie de France à Rome. Vols. I, IV. Paris, 1906, 1923.
- FENGER (L.).—Dorische Polychromie. Text and atlas. Berlin, 1886
- GARDNER (P.).—The Principles of Greek Art. New ed., London, 1924
- GARDNER (P.) and BLOMFIELD (Sir R.).—Greek Art and Architecture. (Reprinted from Livingstone, The Legacy of Greece.) London, 1922.
- HITTORFF (J. I.).—Restitution du Temple d'Empédocle à Sélénonte: ou, l'Architecture polychrôme chez les Grecs. Text and atlas. Paris, 1851.
- JEX-BLAKE (K.) and SELLERS (E.).—The Elder Pliny's Chapters on the History of Art. London, 1896.
- KATTERFELD (E.).—Die Griechischen Metopenbilder. Strassburg, 1911.
- KOHTE (J.).—Die Baukunst des klassischen Altertums. Brunswick, 1915.
- KRELL (P. F.).—Geschichte des Dorischen Styls. Text and atlas. Stuttgart, 1870.
- LAUNAY (R. de).—Le Temple hypéthre. (In *Rev. Arch.*, XIX-XX, 1912.)
- LECHAT (H.).—Le Temple grec. Paris, 1902.
- LETHABY (W. R.).—Greek Buildings Represented by Fragments in the British Museum. London, 1908.
- Greek Afternoons at the British Museum. (In *Builder*, CXVIII-CXIX, 1920.)
- MARQUAND (A.).—Greek Architecture. New York and London, 1909.
- MAUCH (J. M. von).—Die architektonischen Ordnungen der Griechen und Römer. 7th ed. Berlin, 1875.
- MORGAN (M. H.).—Vitruvius, the Ten Books on Architecture. Cambridge, 1914.
- PLINY.—See Jex-Blake and Sellers.
- PUCHSTEIN (O.).—Das Ionische Capitell. Berlin, 1887.
- RAVE (P. O.).—Griechische Tempel. Marburg, 1924.
- SCHEDÉ (M.).—Antikes Traufleisten-Ornament. Strassburg, 1909.
- SOLON (L. V.).—Polychromy, Architectural and Structural. New York, 1924.
- SPIERS (R. P.).—The Orders of Architecture, Greek, Roman and Italian. 3rd ed., London, 1897.
- TATHAM (C. H.).—Etchings of Ancient Ornamental Architecture. 3rd ed., London, 1810.

- TATHAM (C. H.).—Etchings of Grecian and Roman Architectural Ornament.  
New ed., London, 1893.
- VITRUVIUS.—See CHOISY, MORGAN.
- VULLIAMY (L.).—Examples of Ornamental Sculpture in Architecture.  
London, 1824.
- WATT (J. C.).—Greek and Pompeian Decorative Work. London, 1897.
- WEICKERT (C.).—Das Lesbische Kymation. Leipzig, 1913.
- WILBERG (W.).—Die Entwicklung des Dorischen Kapitells. (In *Jahresh. Oest. Arch. Inst.*, XIX-XX, 1919.)

GENERAL WORKS ON THE PRIMITIVE AND ARCHAIC PERIODS  
CHAPTERS II TO IV

- BUHLMANN (M.).—Die Altdorische Saule. (In *Zeitschr. Gesch. d. Architektur*, VI, 1913.)  
— Die Entstehung der Volutenkapitelle. (*Id.*, VII, 1914-19.)
- CHIPIEZ (C.).—Histoire critique des Origines et de la Formation des Ordres grecs. Paris, 1876.
- DORPFELD (W.).—Der antike Ziegelbau und sein Einfluss auf den Dorischen Stil. (In *Hist. u. Philol. Aufsätze Ernst Curtius gewidmet*. Berlin, 1884.)
- DORPFELD (W.) and others.—Über die Verwendung von Terrakotten am Geison und Dache Griechische Bauwerke. Berlin, 1881.
- HOLLAND (L. B.).—The Origin of the Doric Entablature. (In *A. J. A.*, XXI, 1917.)
- HOMOLLE (T.).—L'Origine des Caryatides. (In *Rev. Arch.*, V, 1917.)
- KAWERAU (G.).—Holzsäulen im Dorischen Bau. (In *Zeitschr. Gesch. d. Architektur*, II, 1908/9.)
- KOCH (H.).—Studien zu den Campanischen Dachterrakotten. (In *Rom. Mitt.*, XXX, 1915.)
- LEHMANN-HAUPT (C. F.).—Zur Herkunft der Ionischen Säule. (In *Klio*, XIII, 1913.)
- LICHTENBERG (R. von).—Die Ionische Säule als klassisches Bauglied rein Hellenischen Geistes entwachsen. Leipzig, 1907.
- LUSCHAN (F. von).—Entstehung und Herkunft der Ionischen Säule. Leipzig, 1912.
- PERROT (G.) and CHIPIEZ (C.).—Histoire de l'Art dans l'Antiquité : VII-VIII, La Grèce de l'Epopée, La Grèce archaïque. Paris, 1898-1903.
- PUCHSTEIN (O.).—Die Ionische Säule als klassisches Bauglied orientalischer Herkunft. Leipzig, 1907.
- REBER (F. von).—Über die Anfänge des Ionischen Baustiles. (In *Abh. Mün. Akad.*, XXII, 1900.)
- VAN BUREN (E. D.).—Archaic Fictile Revetments in Sicily and Magna Graecia. London, 1923.
- VOGELSTEIN (J. B.).—Die Ionische Säule. (In *Jahrb. Arch. Inst.*, XXXV, 1920.)
- WASHBURN (O. M.).—The Origin of the Triglyph Frieze. (In *A. J. A.*, XXIII, 1919; cf. XXII, 1918.)
- WURZ (E. and R.).—Die Entstehung der Säulenbasen des Altertums unter Berücksichtigung verwandter Kapitelle. (In *Zeitschr. Gesch. d. Architektur*, Béiheft 15, 1925.)

## GENERAL WORKS ON THE CULMINATING PERIOD

## CHAPTER V

- DINSMOOR (W. B.).—Periclean Architects. (In press.)  
 GOODYEAR (W. H.).—Greek Refinements: Studies in Temperamental Architecture. New Haven, 1912.  
 „ GÜTSCHOW (M.).—Untersuchungen zum Korinthischen Kapitell. (In *Jahrb. Arch. Inst.*, XXXVI, 1921.)  
 HOMOLLE (T.).—L'Origine du Chapiteau Corinthien. (In *Rev. Arch.*, IV, 1916.)  
 PENNETHORNE (J.).—The Geometry and Optics of Ancient Architecture. London and Edinburgh, 1878.  
 PENROSE (F. C.).—An Investigation of the Principles of Athenian Architecture. 2nd ed., London, 1888.

## GENERAL WORKS ON THE LATER PERIODS

## CHAPTERS VI TO VII

- BIEBER (M.).—Die Denkmäler zum Theaterwesen im Altertum. Berlin, 1920.  
 COLLIGNON (M.).—Les Statues Funéraires dans l'Art grec. Paris, 1911.  
 DÖRPFELD (W.).—Das Griechische Theater Vitruvs. (In *Ath. Mitt.*, XXII, 1897; cf. XXIII, 1898.)  
 DÖRPFELD (W.) and REISCH (E.).—Das Griechische Theater. Athens, 1896 (new edition in preparation).  
 FALKENER (E.).—The Grecian House as Described by Vitruvius. (In *Journal R. I. B. A.*, I, 1893/4.)  
 FIECHTER (E.).—Die Baugeschichtliche Entwicklung des antiken Theaters. Munich, 1914.  
 FLICKINGER (R. C.).—The Greek Theater and its Drama. 2nd ed., Chicago, 1922.  
 FRICKENHAUS (A.).—Die Altgriechische Bühne. Strassburg, 1917.  
 GARDNER (E. A.).—The Greek House. (In *J. H. S.*, XXI, 1901.)  
 GARDNER (P.).—Sculptured Tombs of Hellas. New York and London, 1896.  
 GERKAN (A. von).—Das Antike Theater. (In preparation.)  
 —— Griechische Städteanlagen. Berlin and Leipzig, 1924.  
 HAVERFIELD (F.).—Ancient Town Planning. Oxford, 1913.  
 LEHMANN-HARTLEBEN (K.).—Die Antiken Hafenanlagen des Mittelmeeres. Leipzig, 1923.  
 PUCHSTEIN (O.).—Die Griechische Bühne: eine Architektonische Untersuchung. Berlin, 1901.  
 RIDER (B. C.).—The Greek House: its History and Development from the Neolithic Period to the Hellenistic Age. Cambridge, 1916.  
 WYMER (J. E.).—Marktplatz-Anlagen der Griechen und Römer. Munich, 1920.

## LOCAL WORKS: ATHENS AND ATTICA

- AILLEN (G.) and CASKEY (L. D.).—The East Stoa of the Asclepicum at Athens. (In *A. J. A.*, XV, 1911.)  
 BOHN (R.).—Die Propyläen der Akropolis zu Athen. Berlin and Stuttgart, 1892.

- BOHN (R.).—Die Stoa König Attalos des Zweiten zu Athen. (In *Zeitschr. f. Bauwesen*, 1882.)
- BRÜCKNER (A.).—Der Friedhof am Eridanos bei der Hagia Triada zu Athen. Berlin, 1909.
- CHOISY (A.).—Études épigraphiques sur l'Architecture grecque. Paris, 1883-84.
- COLLIGNON (M.) and BOISSONNAS (F.).—L'Acropole d'Athènes. Paris, 1916. (In progress.)
- Le Parthenon. Paris, 1910 (smaller edition, 1914).
- CONZE (A.).—Die Attische Grabreliefs. 4 vols. Berlin, 1893-1922.
- CURTIUS (E.).—Die Stadtgeschichte von Athen. Berlin, 1891.
- DILETTANTI SOCIETY.—The Unedited Antiquities of Attica. London, 1817.
- DINSMOOR (W. B.).—Attic Building Accounts. (In *A. J. A.*, XVII and XXV, 1913 and 1921.)
- The Choragic Monument of Nicias. (In *A. J. A.*, XIV, 1910.)
- The Propylaea of the Acropolis. (In preparation.)
- D'OOGE (M. L.).—The Acropolis of Athens. New York and London, 1908.
- DÖRPFELD (W.).—Untersuchungen am Parthenon. (In *Ath. Mitt.*, VI, 1881.)
- Der Skeuothek des Philon. (In *Ath. Mitt.*, VIII, 1883.)
- Der Tempel von Sunion. (In *Ath. Mitt.*, IX, 1884.)
- Die Propyläen der Akropolis von Athen. (In *Ath. Mitt.*, X, 1885.)
- Das Choragische Monument des Nikias. (In *Ath. Mitt.*, X and XIV, 1885 and 1889.)
- Der Alte Athena-Tempel auf der Akropolis. (In *Ath. Mitt.*, X XII and XV and XXII, 1885-87 and 1890 and 1897.)
- Der Ältere Parthenon. (In *Ath. Mitt.*, XVII and XXVII, 1892 and 1902.)
- Der Ursprüngliche Plan des Erechtheion. (In *Ath. Mitt.*, XXIX, 1904.)
- ELDERKIN (G. W.).—Problems in Periclean Buildings. Princeton, 1912.
- GARDNER (E. A.).—Ancient Athens. New York and London, 1902. (Reprinted 1923.)
- HARRISON (J. E.) and VERRALL (M. G.).—The Mythology and Monuments of Ancient Athens. London and New York, 1890.
- HEBERDEY (R.).—Altattische Poros-Skulptur. Text and atlas. Vienna, 1919.
- HILL (B. H.).—The Older Parthenon. (In *A. J. A.*, XVI, 1912).
- INWOOD (H. W.).—The Erechtheion at Athens. London, 1831.
- JAHN (O.) and MICHAELIS (A.).—Arx Athenarum a Pausania Descripta. 3rd ed., Bonn, 1901.
- JUDEICH (W.).—Topographie von Athen. Munich, 1905.
- KAVVADIAS (P.) and KAWERAU (G.).—Die Ausgrabung der Akropolis. Athens, 1907.
- KAWERAU (G.).—Der Tempel der Roma und des Augustus auf der Akropolis von Athen. (In *Ant. Denk.*, I. 1888.)
- LEBAS (P.) and LANDRON (E.).—Voyage archéologique en Grèce et en Asie Mineure. (Reprinted by S. Reinach.) Paris, 1888.
- LIBERTINI (G.).—I Propilei di A. Claudio Pulcro ad Eleusi. (In *Ann. Scuol. Ital.*, II, 1916.)

- LÜTZOW C. von).—Das Choragische Denkmal des Lysikrates. Leipzig, 1868.
- MARSTRAND (V.).—Arsenalet i Piraeus, og O'dtidens Byggeregler. Copenhagen, 1922.
- MICHAELIS (A.).—Der Parthenon. Text and atlas. Leipzig, 1871.
- MIDDLETON (J. H.).—Plans and Drawings of Athenian Buildings (Suppl. Papers Soc. Prom. Hellenic Studies, III). London, 1900.
- NOACK (F.).—Der Baugeschichtlichen Entwicklung des Eleusinischen Heiligtums. (In preparation).
- ORLANDOS (A. K.).—Τὸ ἀέτωμα τοῦ ἐν Σουνίᾳ ναοῦ τοῦ Ποσειδῶνος. (In 'Αρχ. Δελτ., I, 1915.)  
——— Τοῦ ἐν Σουνίᾳ ναοῦ τοῦ Ποσειδῶνος τοῖχοι καὶ ὄφοφή (In 'Εφ 'Αρχ., 1917.)  
——— 'Ο ἐν Ελευσίνῃ ναὸς τῆς Προπυλαίας Ἀρτέμιδος. Athens, 1920.
- PRASCHNIKER (C.).—Die Akroterien des Parthenon. (In *Jahresh. Oest. Arch. Inst.*, XIII, 1910.)
- ROSS (L.), SCHUBERT (E.) and HANSEN (C.).—Der Tempel der Nike Apteros. Berlin, 1839.
- SAUER (B.).—Das sogenannte Theseion und sein plastischer Schmuck. Leipzig, 1899.
- SCHEDÉ (M.).—The Acropolis of Athens. Berlin, 1922.
- SCHULTZ (R. W.), GARDNER (E. A.) and BARNSLEY (S. H.).—The North Doorway of the Erechtheum. (In *J.H.S.*, XII, 1891.)
- SMITH (A. H.).—British Museum; Sculptures of the Parthenon. London, 1910.
- STEVENS (G. P.).—The Ceiling of the Opisthodomus of the Theseum. (In *A.J.A.*, XV, 1911.)
- STEVENS (G. P.) and others—The Erechtheum. (In press.)
- STUART (J.) and REVETT (N.).—The Antiquities of Athens. 4 vols. London, 1762-1816. Suppl. vol. (edited by C. R. Cockerell), London, 1830.
- TUCKERMANN (W. P.).—Das Odeum des Herodes Atticus und der Regilla in Athen. Bonn, 1868.
- WELLER (C. H.).—Athens and its Monuments. New York, 1913.
- WIEGAND (T.).—Die archaische Poros-Architektur der Akropolis zu Athen. Text and atlas. Cassel and Leipzig, 1904.

#### LOCAL WORKS : PELOPONNESUS AND ADJOINING ISLANDS

- AMERICAN SCHOOL AT ATHENS.—The Excavations of Corinth. (In preparation.)
- BLOUET (A.).—Expédition scientifique de Morée (Péloponnèse, des Cyclades, et de l'Attique). 3 vols. Paris, 1831-38.
- COCKERELL (C. R.).—The Temples of Jupiter Panhellenius at Aegina and of Apollo Epicurius at Bassae. London, 1860.
- CURTIUS (E.) and ADLER (F.).—Olympia : Die Ergebnisse der vom Deutschen Reich veranstalteten Ausgrabungen. 5 vols. text and 5 vols. atlas. Berlin, 1890-97.
- DEFRASSÉ (A.) and LECHAT (H.).—Épidaure. Paris, 1895.
- DÖRPFELD (W.).—Der Tempel in Korinth. (In *Ath. Mitt.*, XI, 1886.)
- DUGAS (C.), BERCHMANS (J.) and CLEMMENSEN (M.).—Le Sanctuaire d'Aléa Athéna à Tégée au IV<sup>e</sup> Siècle. Paris, 1924.

- ÉCOLE FRANÇAISE D'ATHÈNES.—Exploration archéologique de Délos. Paris, 1909 (in progress).
- FURTWÄNGLER (A.).—Aegina : Das Heiligtum der Aphaia. 2 vols. Munich, 1906.
- GARDINER (E. N.).—Olympia, its History and Remains. Oxford, 1925.
- GARNIER (C.).—Ile d'Egine, Temple de Jupiter Panhellénien. Paris, 1884.
- HEROLD (R.) and DÖRPFELD (W.).—Der Rundbau in Epidauros. (In *Ant. Denk.*, II, 1891-2.)
- KAVVADIAS (P.).—Fouilles d'Epidaure. Athens, 1893.
- LALOUX (V.) and MONCEAUX (P.).—Restauration d'Olympie. Paris, 1889.
- LEBAS—as cited s.v. ATHENS.
- SCHULTZ (R. W.) and others—Excavations at Megalopolis, 1890-1891. (Suppl. Papers Soc. Prom. Hellenic Studies, I). London, 1892.
- VALLOIS (R.) and CLEMMENSEN (M.).—Temple de Zeus à Némée. (In *B.C.H.*, XLIX, 1925.)
- WALDSTEIN (Sir C.) and others—The Argive Heraeum. 2 vols. Boston and New York, 1902-05.

#### LOCAL WORKS : NORTHERN GREECE AND MACEDONIA

- BOURGUET (E.).—Les Ruines de Delphes. Paris, 1914.
- DINSMOOR (W. B.).—Studies of the Delphian Treasuries. (In *B.C.H.*, XXXVI and XXXVII, 1912 and 1913.)
- ÉCOLE FRANÇAISE D'ATHÈNES.—Fouilles de Delphes. Paris, 1902. (In progress.)
- HEUZEY (L.) and DAUMET (H.).—Mission archéologique de Macédoine. 2 vols. Paris, 1867-76.
- KAWERAU (G.) and SOTERIADIS (G.).—Der Apollotempel zu Thermos. (In *Ant. Denk.*, II, 1902-08.)
- ORLANDOS (A. K.). 'Ο ἐν Σπράτῳ τῆς Ἀκαρνανίας ναὸς τοῦ Διός. (In *Ἄρχ. Δελτ.*, VIII, 1923.)
- POULSEN (F.).—Delphi. London, 1920.

#### LOCAL WORKS : ASIA MINOR AND EGYPT

- ADLER (F.).—Das Mausoleum zu Halikarnass. (In *Zeitschr. f. Bauwesen*, 1900.)
- BACON (F. H.).—Investigations at Assos. Boston, 1902-21.
- BENNDORF (O.) and NIEMANN (G.).—Reisen in Lykien und Karien. Vienna, 1884.
- BOHN (R.) and SCHUCHHARDT (C.).—Die Altertümer von Aegae. Berlin, 1889.
- BUHLMANN (J.).—Das Mausoleum in Halikarnass. (In *Zeitschr. Gesch. d. Architektur*, II, 1908/9.)
- BUTLER (H. C.) and others—Sardis. Leyden and Princeton, 1922. (In progress.)
- DILETTANTI SOCIETY.—The Antiquities of Ionia. 5 vols. London, 1797-1915.
- DINSMOOR (W. B.).—The Mausoleum at Halicarnassus. (In *A.J.A.*, XII, 1908.)
- FALKENER (E.).—Ephesus and the Temple of Diana. London, 1862.

- FELLOWS (Sir C.).—Journal during an Excursion in Asia Minor. London, 1839.
- Account of the Ionic Trophy Monument Excavated at Xanthus. London, 1848.
- FELLOWS (Sir C.) and SCHARF (G.).—Lycia, Caria, and Lydia. London, 1847.
- GERKAN (A. von).—Das Theater von Priene. Munich, 1921.
- HAMDY BEY (O.) and REINACH (T.).—Une Necropole royale à Sidon. 2 vols. Paris, 1892-96.
- HOGARTH (D. G.).—British Museum: Excavations at Ephesus, the Archaic Artemisia. Text and atlas. London, 1908.
- HUMANN (C.).—Magnesia am Maeander: Bericht über die Ergebnisse der Ausgrabungen der Jahre 1891-1893. Berlin, 1904.
- HUMANN (C.) and PUCHSTEIN (O.).—Reisen in Kleinasien und Nord-Syrien. 2 vols. Berlin, 1890.
- KOLDEWEY (R.).—Die antiken Baureste der Insel Lesbos. Berlin, 1890.
- Neandreia. Berlin, 1891.
- LABORDE (A. de).—Voyage en Orient: Asie Mineure et Syrie. 2 vols. Paris, 1838.
- LANCKORONSKI (K.), NIEMANN (G.) and PETERSEN (E.).—Städte Pamphyliens und Pisidiens. 2 vols. Vienna, 1890.
- LEBAS.—As cited s.v. ATHENS.
- MURRAY (A. S.).—The Sculptured Columns of the Temple of Diana at Ephesus. (In *Journal R. I. B. A.*, III, 1895/6).
- MYRES (J. L.) and OHNEFALSCH-RICHTER (M. H.).—Catalogue of the Cyprus Museum. Oxford, 1899.
- NEWTON (Sir C. T.).—History of Discoveries at Halicarnassus, Cnidus, and Branchidae. Text and Atlas. London, 1863.
- Travels and Discoveries in the Levant. 2 vols. London, 1865.
- NIEMANN (G.).—Das Nereiden-Monument in Xanthos. Vienna, 1921.
- OESTERREICHISCHES ARCHÄOLOGISCHES INSTITUT.—Forschungen in Ephesos Vienna, 1906. (In progress.)
- OHNEFALSCH-RICHTER (M. H.).—Kypros, the Bible, and Homer. London, 1893.
- PERROT (G.) and GUILLAUME (E.).—Exploration archéologique de la Galatie et de la Bithynie, d'une partie de la Mysie, de la Phrygie, de la Cappadoce et du Pont. Paris, 1861.
- PETERSEN (E.) and LUSCHAN (F. von).—Reisen in Lykien, Milyas, und Kibyratis. Vienna, 1889.
- PETRIE (W. M. F.) and GARDNER (E. A.).—Naukratis. 2 vols. London, 1886-88.
- PICARD (C.).—Ephèse et Cläre. Paris, 1922.
- PONTREMOLI (E.) and COLLIGNON (M.).—Pergame. Paris, 1900.
- PONTREMOLI (E.) and HAUSSOULLIER (B.).—Didymes. Paris, 1904.
- RAYET (O.) and THOMAS (A.).—Milet et la Golfe Latmique. Text and atlas. Paris, 1877-80 (incomplete).
- STAATLICHE MUSEEN ZU BERLIN.—Altertümer von Pergamon. Berlin, 1885. (In progress.)
- STEVENSON (J. J.).—A Restoration of the Mausoleum at Halicarnassus. London, 1909.
- TEXIER (C.).—Description de l'Asie Mineure. 3 vols. Paris, 1839-49.

- TEXIER (C.) and PULLAN (R. P.).—The Principal Ruins of Asia Minor. London, 1865.
- TREMAUX (P.).—Exploration archéologique en Asie Mineure. Paris, 1852.
- WIEGAND (T.).—Siebenter vorläufiger Bericht über die in Milet und Didyma unternommenen Ausgrabungen. (In *Abh. Berl. Akad.*, 1911.)
- Erster vorläufiger Bericht über die Ausgrabungen in Samos. (In *Abh. Berl. Akad.*, 1911.)
- WIEGAND (T.) and others.—Milet. Ergebnisse der Ausgrabungen und Untersuchungen seit dem Jahre 1899. Berlin, 1906. (In progress.)
- WIEGAND (T.) and SCHRADER (H.).—Priene: Ergebnisse der Ausgrabungen und Untersuchungen in den Jahren 1895-1898. Berlin, 1904.
- WOOD (J. T.).—Discoveries at Ephesus. London, 1877.

## LOCAL WORKS: SICILY AND MAGNA GRAECIA

HITTORFF (J. I.) and ZANTH (L.).—Architecture antique de la Sicile: Recueil des Monuments de Segeste et de Sélinonte. Text and atlas. 2nd ed., Paris, 1870.

HULOT (J.) and FOUGÈRES (G.).—Sélinonte. Paris, 1910.

KOLDEWEY (R.) and PUCHSTEIN (O.).—Die Griechischen Tempel in Unteritalien und Sicilien. Berlin, 1899.

LABROUSTE (H.).—Les Temples de Paestum. Paris, 1877.

LUYNES (Duc de) and DEBACQ (F. J.).—Métagonte. Paris, 1833.

PACE (B.).—Il Tempio di Giove Olimpico in Agrigento. (In *Mon. Ant.*, XXVIII, 1922.)

SERRADIFALCO (Duca di).—Le Antichità della Sicilia. 5 vols. Palermo, 1834-42.

WILKINS (W.).—Antiquities of Magna Graecia. Cambridge and London, 1807.

## LIST OF PERIODICALS CITED

American Journal of Archaeology.

Abhandlungen der Berliner Akademie.

Abhandlungen der Münchener Akademie.

Annuario della Scuola Italiana di Atene.

Antike Denkmäler.

Archaeologia.

*'Αρχαιολογικὸν Δελτίον.*

Athenische Mittellungen, Deutsches Archäologisches Institut).

Bulletin de Correspondance Hellénique.

British School at Athens Annual.

Builder.

*'Εφημερίς Αρχαιολογικής*

Journal of Hellenic Studies.

Jahrbüch der Deutschen Archäologischen Instituts.

Jahreshefte des Österreichischen Archäologischen Instituts.

Journal of the Royal Institute of British Architects.

Klio (Beiträge zur Alten Geschichte).

Monumenti Antichi della R. Accademia Nazionale dei Lincei).

Review Archéologique.

Römische Mittellungen, Deutsches Archäologisches Institut).

Zeitschrift für Bauwesen.

Zeitschrift für Geschichte der Architektur.



## GLOSSARY

**Abacus.**—The uppermost member of a capital. Plain in the Doric order, moulded in the Ionic and Corinthian orders. The sides are concave in the Corinthian capital, and curve out over the canted volute of the Ionic capital.

**Abutment.**—The masonry, brickwork, or earth which counteracts the thrust of an arch or vault.

**Acroterium (*pl. Acroteria*).**—The figures or ornaments at the lower angles or apex of a pediment generally supported on plinths.

**Agora.**—A public square or market-place in Greek cities corresponding to the Forum in Roman cities.

**Aisle (Lat., *ala*, a wing).**—Term given to the side passages in a hall or cella, separated from one another and from the central nave by columns or piers.

**Amphidistyle-in-antis.**—Term applied to a temple with two columns between antae at both front and rear. *See Temples.*

**Amphiprostyle.**—Term applied to a temple with portico of columns in front and rear only. *See Temples.*

**Ancones.**—Projecting bosses left on masonry blocks.

**Anta (*pl. Antae*).**—Pilaster (or corner post) of slight projection terminating the end of the lateral walls of a cella, and serving as respond to a column. In the latter case the columns are said to be in-antis.

**Antefix.**—The decorative termination of the covering tiles over the joints between the flat tiles of a roof, placed either directly on the eaves tiles or on the top of the sima, sometimes also on the crest of the ridge.

**Anthemion (Gr. *ἄνθος*, a flower).**—A continuous pattern of alternating palmette and lotus (the latter generally much conventionalized and so sometimes, but erroneously, called honeysuckle), often rising from nests of acanthus leaves and connected by scrolls.

**Apophyge** (*ἀπό*, from, and *φεύγω*, I flee).—A. The cavetto or concave sweep taken by the end of the shaft in the Ionic and Corinthian Orders in its junction with the upper or lower fillet. B. The similar curve of the necking beneath the Doric echinus, forming the junction between the capital and the shaft.

**Apse**.—A recess in the wall of a building, generally semi-circular and vaulted over.

**Apteros**.—Without wings; as applied to the statue and temple of Wingless Victory (Nike Apteros), at Athens.

**Araeostyle**.—Wide-spaced. The term given by Vitruvius to wide intercolumniations, carrying an architrave in timber. *See INTERCOLUMNIACTION*.

**Architrave**.—A lintel in stone or beam of timber carried from the top of one column or pier to another; the lowest member of the entablature (*q. v.*). Applied also to the lintel and side posts or jambs of a door or window.

**Archivolt**.—A moulded architrave carried round an arch.

**Arris**.—A sharp edge formed by two surfaces meeting at an external angle as in the flutings of the Doric column.

**Ashlar Masonry**.—The term applied to regular masonry of squared stone, with horizontal courses and approximately or perfectly vertical joints.

**Atlantes**.—The Greek term for the male figures employed in architecture in place of columns. *See TELAMONES*.

**Astragal**.—A small moulding of rounded, convex section.

**Atrium**.—The entrance court of a Roman house, roofed over at the sides, but open to the sky in the centre. In an atrium of large size four or more columns would be introduced to carry the roof.

**Attic**.—Term applied to a storey above the main cornice, sometimes decorated with bas-reliefs, or utilised for an inscription.

**Attic base**.—The favourite type of Ionic base, consisting of an upper and lower torus and a scotia between, with fillets.

**Barrow**.—Mound of stones or earth over the remains of the dead.

**Basilica**.—The Roman exchange and court of law. An oblong rectangular building usually with aisles around and provided at the middle of one side or at one or both ends with a recess used as the Tribune; the plan is derived from the Stoa Basileios at Athens.

**Bibliotheca** (Library). A chamber provided with cases to hold manuscript rolls.

**Bouleuterion**.—The Greek Senate House.

**Canalis** (Channel).—Term given to the space between the fillets of an Ionic volute : in early work, convex ; in the fully developed types, concave.

**Carceres**.—A row of stalls or horse-boxes at one end of a hippodrome or circus enclosed by double doors, within which the chariots waited till the signal was given for starting, when the doors were simultaneously thrown open.

**Caryatids**.—Figures of maidens which take the place of columns in supporting an entablature, as in the South Porch of the Erechtheum, Athens.

**Cauliculus**.—The stalk or stem from which spring the acanthus leaves supporting the volutes or fleurons in the Corinthian capital.

**Cavea**.—The auditorium of a theatre, so called because originally it was excavated in the rocky side of a hill.

**Cella**.—The enclosed chamber or sanctuary of a temple, also known by the Greek term *naos*.

**Chresmographion**.—The term given to the chamber between the pronaos and the naos or cella of a Greek temple where oracles were delivered, as at Didyma.

**Chryselephantine**.—The term applied to a statue in which a wooden core is overlaid with gold and ivory, the drapery and ornaments being of the former and the flesh of the latter material.

**Clepsydra**.—A vessel employed in ancient days to measure time by the running out of a certain quantity of water. There was one in the Tower of the Winds at Athens, and the turret on the south side is supposed to have contained the cistern which supplied the water.

**Coffer**.—A sunk panel in a vault or ceiling.

**Colonnade**.—A range of columns. *See PORTICO*.

**Columnae Caelatae**.—The term given by Pliny to the sculptured columns of the Temple of Artemis at Ephesus.

**Columbarium**.—A pigeon-house. The plural, "columbaria," is applied to designate the apertures formed in walls to hold cinerary urns, and hence to the sepulchral chambers themselves.

**Cornice**.—The upper member of the entablature (*q.v.*) subdivided into bed-mould, corona, and sima, though the last properly

belongs to the roof ; a term also employed for any projection on a wall, provided to throw the rain-water from the face of the building.

**Corona.**—The projecting member of the cornice having a vertical face.

**Crepidoma.**—The term applied to the stepped platform of a Greek temple.

**Cunei.**—The wedge-shaped groups into which the seats of a theatre are divided by radiating passages.

**Cyclopean Masonry.**—The term applied to the rude but massive masonry employed by the Aegean peoples and by the early Greeks and Etruscans in the walls of their cities and citadels.

**Cymatium.**—A wave moulding of double curvature. When the concave portion is uppermost it is called a cyma-recta ; when the convex part is at the top it is called cyma-reversa ; the Doric hawksbeak is another example of such a moulding.

**Dado.**—The lower portion of a wall when treated as a continuous pedestal or wainscot ; sometimes only the plain surface between the base and top mouldings of such a pedestal.

**Decastyle.**—Temple front with ten columns. *See TEMPLES.*

**Dentil.**—Rectangular blocks in the bed-mould of a cornice originally representing the ends of joists which carried a flat roof.

**Diastyle.**—*See INTERCOLUMNNIATION.*

**Diaulos.**—The peristyle round the great court of the Palaestra described by Vitruvius (V. 11).

**Diazoma.**—The Greek term for a horizontal passage which separated the several ranges of seats in a theatre or stadium.

**Die.**—The vertical face of a pedestal or podium.

**Dipteral.**—Term applied to a temple surrounded by two rows of columns, a double peristyle. *See TEMPLES.*

**Distyle-in-antis.**—Temple front with two columns between antae. *See TEMPLES.*

**Dodecastyle.**—Temple front with twelve columns. *See TEMPLES.*

**Echinus.**—The convex moulding of circular plan which supports the abacus of a Doric capital. Also the similar moulding carved with egg and tongue placed under the cushion of the Ionic capital and appearing between the volutes.

**Enneastyle.**—Temple front with nine columns. *See TEMPLES.*

**Entablature.**—The superstructure carried by columns ; it is occasionally used to complete, architecturally, the upper portion of a wall, even when there are no columns, and in the case of pilasters or detached or engaged columns is sometimes profiled round them. It is usually divided into three parts : viz., the architrave (the supporting member, carried from column to column) ; the frieze (the decorative portion) ; and the cornice (the crowning and projecting member). The frieze is often omitted in the Asiatic Ionic order.

**Entasis.**—The slight convex curve given to the arris of a Doric column, or to the fillets between the flutes of other columns, in order to correct an optical illusion ; if the shaft tapered upward in absolutely straight lines, the silhouette of the column would appear concave.

**Epistyle.**—The Greek term for the architrave (*q.v.*).

**Eustyle.**—*See INTERCOLUMNIACTION.*

**Exedra.**—A semi-circular stone or marble seat, or a rectangular or semi-circular recess.

**Fascia.**—The term given to the planes into which the architrave of the Ionic and Corinthian Orders is subdivided.

**Flutes.**—The vertical channels (segmental, elliptical, or semi-circular in horizontal section) employed in the shafts of columns in the classic styles. The flutes are separated one from the other by an arris in the Greek Doric and early Ionic Orders, and by a fillet in the developed Ionic and Corinthian Orders. In early and late Doric columns the flute was usually segmental, but at the best period, in order to emphasize the arris, it was formed of three arcs constituting what is known as a false ellipse ; a similar but deeper curve was given to the flutes in Greek Ionic and Corinthian columns ; in later work the flute was semi-circular. In rare examples the flutes were carried spirally round the columns.

**Frieze.**—The middle member of the entablature. Applied also to any horizontal band enriched with sculpture. *See ZOPHOROS.*

**Groin.**—The arris formed by the intersection of two barrel vaults.

**Guilloche.**—A continuous plaited pattern of interwoven fillets, leaving circular centres, sometimes filled with rosettes.

**Guttae** (drops).—Small pendant tapering cylinders like pegs under the triglyphs and mutules of a Doric entablature. *See TRUNNEL.*

**Gymnasium**.—A school for physical education and training, particularly for exercises requiring considerable space, such as running.

**Helix**.—The Greek term for a volute spiral, as used in the Ionic or Corinthian capitals.

**Hemicycle**.—Term given to semi-circular recesses of great size, sometimes vaulted.

**Heptastyle**.—Temple front with seven columns. *See TEMPLES.*

**Hexastyle**.—Temple front with six columns. *See TEMPLES.*

**Hieron**.—The name given to the sacred enclosure or Temenos of some Greek temples, as at Epidaurus.

**Hippodrome**.—The course provided by the Greeks for horse and chariot racing.

**Hypaethral**.—Term given to a temple the naos of which was wholly or partly open to the sky.

**Hypotrachelium** (Gr., under the neck).—One or more grooves under the necking or gorge of the Greek Doric capital which mask the junction of capital and shaft.

**Impluvium**.—A shallow tank in the floor of the atrium of a house, provided to receive the rain falling through the roof; used also of any shallow tank sunk in a floor.

**Intercolumniation**.—The distance between the columns of a colonnade, defined in terms of the lower diameter of the columns. They are thus set forth by Vitruvius (III. 3).—Pycnostyle, where the columns are  $1\frac{1}{2}$  diameters apart; Systyle, 2 diameters; Eustyle,  $2\frac{1}{2}$  diameters; Diastyle, 3 diameters; and Araeostyle,  $3\frac{1}{2}$  diameters; the latter carrying architraves in wood only. Very different spacings, however, were used in the better periods of Greek architecture.

**Meander**.—A continuous fret or key pattern, like a rectangular spiral.

**Megaron**.—The principal or men's hall in the Mycenaean palace.

**Metope** (Gr., between the holes).—Originally the panels of brick wall between the holes left for the ends of the beams of the Doric ceiling, and applied afterwards to the sunk panels between the triglyphs (*q.v.*).

**Modillion.**—The horizontal corbels carrying the corona of a Corinthian cornice.

**Module.**—Usually the half diameter of the lower part of the shaft of a Doric column, or the full lower diameter of an Ionic column.

**Monopteral.**—Term applied to a circular temple with columns only, lacking a cella. *See TEMPLE.*

**Mutule.**—A projecting slab on the soffit of the Doric cornice.

**Nymphaeum.**—A chamber (sometimes subterranean) in which were plants and flowers and a fountain or running water.

**Naos.**—The term given to the cella of the Greek temple.

**Octastyle.**—Temple front with eight columns. *See TEMPLES.*

**Odeum.**—A roofed building in which rehearsals and musical contests took place.

**Oecus.**—In Greek houses (according to Vitruvius, VI. 10) the room in which the mistress of the house sat with the spinstresses. It was used also as a banqueting room. There were four kinds of oeci, viz., the Tetrastyle, the Corinthian, the Egyptian, and the Cyzicene.

**Opiaon.**—The Greek word for the clerestory formed by a lantern projecting above a roof. Applied also to an hypaethral opening in a roof.

**Opisthodomus.**—The recessed porch in the rear of a Greek temple, sometimes enclosed with bronze grilles and serving as a treasury; hence used also as the name of a treasury on the Athenian Acropolis.

**Orthostates.**—The bottom course of the walls of the naos of a Greek temple, generally twice or three times the height of the upper courses.

**Palaestra.**—A training school for physical exercises, smaller than the gymnasium and used for such events as wrestling, boxing, etc.

**Parascenium.**—The symmetrical wings of the scene building which project into the orchestra.

**Patera.**—The representation of a flat, round dish or disk, usually decorated; used to ornament a panel, frieze, etc.

**Pentastyle.**—Temple front with five columns. *See TEMPLES.*

**Peripteral.**—Term applied to a temple, the cella of which is surrounded by a peristyle. *See TEMPLES.*

**Peristyle.**—Term given (A) to a covered colonnade which surrounds a building, (B) to an inner court lined with a colonnade.

**Pinacotheca.**—A picture gallery.

**Podium.**—The Greek term for a low wall or continuous pedestal on which columns, or even entire temples, are carried. It consisted of a plinth, a dado and a cornice.

**Polygonal Masonry.**—The term applied to carefully fitted masonry in which the stones are not squared, but are hewn into polygons or wavy shapes which approximate the original shapes of the rough stones, but permit accurate adjustment to their neighbours, the exposed faces afterwards dressed perfectly smooth, so that the finished wall presents the appearance of a picture puzzle.

**Portico.**—A porch or entrance to a building. The term, when applied to a Greek or Roman temple, is classed as (Distyle-in-antae), two columns between antae; (Tetrastyle Prostyle), four columns in front; (Hexastyle), six columns; (Heptastyle), seven columns; (Octastyle), eight columns; (Enneastyle), nine columns; (Decastyle), ten columns; and (Dodecastyle), twelve columns.  
*See TEMPLES.*

**Posticum.**—The Latin term for the recessed porch in the rear of a temple, the opisthodomus.

**Pronaos.**—The porch in front of the naos or cella.

**Propylaeum.**—The entrance gate to the Temenos or sacred enclosure of a temple, when there is one doorway only; when there is more than one doorway, as at Athens and Eleusis, the plural form *propylaea* is used.

**Propylon.**—A very simple building of the propylaeum type.

**Proscenium.**—A colonnade six to ten feet deep and ten to thirteen feet high between the orchestra and the scene building, usually terminated at either end with a parascenium.

**Prostyle.**—Term applied to a temple with portico of columns in the front. *See TEMPLES.*

**Prytaneum.**—The state dining-room or guest-house in a Greek city.

**Pseudodipteral.**—Term applied to a dipteral temple with the inner rows of columns omitted. *See TEMPLES.*

**Pseudoperipteral.**—Term applied to a peripteral temple where some of the columns are engaged in the wall of the cella. *See TEMPLES.*

**Pteroma.**—The passage between the walls of the cella and the peristyle.

**Pteron** (Gr., Wing).—The wing or flank colonnade of a temple, and so used by Pliny of the colonnade carrying the superstructure of the tomb of Mausolus.

**Pycnostyle.**—*See INTERCOLUMNIACTION.*

**Quadriga.**—The ancient four-horsed chariot.

**Regula.**—A narrow strip under the taenia of a Doric architrave, beneath which the guttae are carved.

**Respond.**—(1) The wall pilaster behind a column. (2) The wall pier carrying either the end of an architrave or beam or the springing of an arch.

**Scene** (Gr., Tent).—A term used first of the player's booth, and afterwards of the building which replaced it, the back scene of the theatre ; hence the word proscenium and parascenium.

**Sima.**—The term given to the terra-cotta or marble gutter of a building, both on the gables and on the flanks ; it may or may not be moulded ; on the flanks it is provided with outlets for rain-water at intervals, often in the form of lions' heads.

**Spina.**—The podium wall down the centre of the hippodrome.

**Stadium.**—A racecourse of fixed dimension, viz., six hundred Greek feet ; a term applied also to that measure of length.

**Stele.**—Term given to (1) an upright Greek tombstone ; (2) to any upright stone slab used for sculptured reliefs or for inscriptions.

**Stereobate.**—The substructure of a temple.

**Stoa.**—In Greek architecture a term corresponding with the Latin porticus, a building with its roof supported by one or more rows of columns parallel to the rear wall.

**Stylobate.**—The upper step of a temple, which formed a platform for the columns. The term is sometimes misapplied to the three steps, properly known as the crepidoma.

**Systyle.**—*See INTERCOLUMNIACTION.*

**Taenia.**—The projecting fillet which crowns the architrave of the Doric entablature.

**Telamones.**—The Roman term for male figures forming supports.  
*See ATLANTES.*

**Temenos.**—The sacred enclosure in which one or more Greek temples stand.

**Temples.**—*Types of Plan:*

Distyle-in-antis—So-called Temple of Themis at Rhamnus (Doric).

Amphidistyle-in-antis—No examples known, except those with engaged columns at the rear, viz., Temples of Asclepius at Acragas and of Serapis at Taormina (Doric).

Tetrastyle prostyle—Temple “B” at Selinus, Temple of Dionysus at Pergamum (Doric).

Tetrastyle amphiprostyle—Temple of Artemis Propylaea at Eleusis (Doric); Temples on the Ilissus and of Nike Apteros at Athens (Ionic).

Tetrastyle pseudoperipteral—Temple at Cnidus (Corinthian).

Pentastyle peripteral—Temple of Apollo, Thermum (Doric).

Hexastyle peripteral—Heraeum at Olympia, Temples at Syracuse (Apollo, Zeus, Athena), Selinus (“A,” “C,” “D,” “ER,” “FS”), Acragas (Heracles, Hera, Concord), Paestum (Demeter, Poseidon), and Segesta, Tavole Paladine at Metapontum, Older Parthenon and Theseum at Athens, Temples of Athena at Assos, Athens, Pergamum, and Tegea, of Apollo at Corinth, Bassae, and Delphi, of Zeus at Olympia, Nemea, and Stratos, of Hera at Argos, of Poseidon at Sunium, of Asclepius at Epidaurus, of Nemesis at Rhamnus, Metroum at Olympia (Doric); Temples of Athena Polias at Priene, of Dionysus at Teos, and the Temples at Sagalassus and Euromus (Ionic).

Heptastyle pseudoperipteral—Temple of Zeus at Acragas (Doric).

Octostyle peripteral—The Parthenon, Athens (Doric).

Octostyle dipteral—Temples of Artemis at Ephesus, of Hera at Samos (Ionic), and of Zeus Olympius at Athens (Corinthian).

Octostyle pseudodipteral—Temple “GT” at Selinus (Doric); Temples of Artemis at Magnesia and Sardis, of Apollo at Sminthe, of Aprodite at Aphrodisias, of Zeus at Aezani, and at Messa in Lesbos (Ionic).

Enneastyle peripteral—The so-called Basilica at Paestum.

Decastyle dipteral—Temple of Apollo at Didyma (Ionic).

Dodecastyle prostyle—Telesterion at Eleusis (Doric).

*Circular Temples :*

**Monopteral**—Temple of Roma and Augustus at Athens (Ionic).

**Peripteral**—Tholos at Epidaurus and at Delphi (Doric); Philipeum at Olympia (Ionic).

**Tetrastyle**.—Temple front with four columns. *See TEMPLES.*

**Tholos**.—Term given to a Greek circular temple with or without a peristyle.

**Trachelium** (Gr.).—The necking or gorge of the Greek Doric capital between the annulets on the echinus and the grooves which mask the junction of capital and shaft.

**Triclinium**.—The dining-room of a Greek or Roman house, so called from *κλίνη*, a couch, as it contained three couches upon which the ancients reclined at meals.

**Triglyph**.—A projecting member separating the metopes, emphasised with vertical channels and chamfers, a survival of the primitive beam end.

**Trunnel**.—A pin or peg, carved in stone beneath the regula of the architrave and the mutule of the cornice. *See GUTTAE.*

**Tympanum**.—Term given to the triangular wall enclosed by the raking cornice of the pediment and the horizontal cornices of the entablature beneath.

**Volute**.—The spiral scroll of the Ionic capital.

**Vousoir**.—A wedge-shaped stone which forms one of the units of an arch.

**Xoanon**.—A rude and primitive image of a deity, carved in wood.

**Xystus**.—A Roman garden planted with groves of plane trees, and laid out with flower-beds. In Greece the xystus was a covered promenade or covered running track.

**Zophoros** or **Zoophoros**.—Term given to a continuous frieze sculptured in relief with the forms of human beings and animals.



## ALPHABETICAL LIST OF ILLUSTRATIONS.

(Arabic numerals refer to the PAGE numbers of illustrations ; Roman numerals to the PLATE numbers).

- Acragas :  
Olympieum at, 92  
Temple of Asclepius, 162  
Temple of Concord, XXI  
Temple of Zeus Olympius, 91  
Aegina, Temple of Aphaea, 89, XX  
Aezani, Temple of Zeus, 164  
Agrigentum, Temple of Juno Lacinia,  
XX  
Alinda, Stoa at, 178  
Assos :  
Agora at, 177  
Temple at, 86  
Athens :  
Acropolis, 132, I (*frontispiece*),  
XLIV, XLV, XLVII  
Chair in the Theatre, LV  
Choragic Columns on Acropolis, III  
Erechtheum, 128, 129, XXXVIII,  
XLI, XLII, XLIII  
Grave Monument of Dexileos, 153  
Monument to Lysicrates, LIV,  
LV  
Panathenaic Stadium, LVI  
Parthenon, XXXIII, XXXIV,  
XXXV, XXXVI  
Propylaea, 133, XLII, XLIII,  
XLVI  
Stoa of Attalus, 179  
Temple of Athena Nike, 126, XL  
Temple of Roma, 167  
Temple of Zeus Olympius, 165, 166  
Temple on the Ilissus, XL  
Theseum, XXXVII, XXXVIII,  
XXXIX  
Tower of the Winds, LXIV  
Votive Capitals, 106
- Bassae :  
Corinthian Order from, XXXII  
Ionic Order from, XXXII  
Temple of Apollo Epicurius, 113,  
XXXI, XXXIII  
Roof Tiles at, 116  
Bracket Capital, V,

- Capitals .  
Archaic, X, XXVI  
Bracket, V  
Corinthian, 71, 146, III, LII, LIV,  
LV, LX  
Doric, 84, III, XIX, LIV  
Ionic, 100, 103, 105, 106, XXVII,  
XXVIII, XXXII, XLIII, XLIX,  
LII, LX  
Proto-Ionic, 71, XVI  
Cnossus :  
Alabaster Frieze from, V  
Faience house-fronts, IV  
Palace of, domestic quarter, 24  
Great staircase, VI  
Light-shaft, VI  
Plan, 20  
Throne-room, V  
Temple Frieze from, VII  
Construction of Columns, 123  
Corinth, Temple at, 87, XIX  
Curvature of Stylobate, 120
- Delos :  
Houses at, 185  
House of Cleopatra, LXV  
Sanctuary of the Bulls, 170  
Votive Capitals from, 106
- Delphi :  
Acanthus Column at, 154  
Athenian Treasury, XXVI  
Capital from, XXVI  
Cornice and Sima Decoration,  
XXVIII  
Precinct of Apollo, XXV  
Siphnian Treasury, XXIX  
Tholos at, LIII, LIV
- Didyma :  
Capital from Temple of Apollo, 146  
Temple of Apollo, 144, XLIX, LI,  
LII
- Eleusis :  
Hall of the Mysteries at, 131  
Lesser Propylaea, LVIII, LX, LXI  
Entasis of Doric Columns, 121

- Ephesus :**
- Capitals from Archaic Temple, 100, XXVII
  - Later Temple of Artemis, 141, L, LI
  - Plan of, 173
  - Theatre at, 180, LXV
- Epidaurus :**
- Palaestra at, 183
  - Theatre at, 157, LVI, LVII
  - Tholos at, 147, LII
- Halicarnassus, Mausoleum at,** XLIX, LIII
- Inclinations of Doric Columns,** 122
- Korakou :**
- Apsidal House at, 17
  - Rectangular House at, 18
- Larissa, Capital from,** XVI
- Locri, Capitals from,** 105
- Magasa, Neolithic House at,** 14
- Magnesia, Temple of Artemis,** 163, LX
- Megalopolis, Thersilion at,** 156
- Melos, Urn showing round houses at,** IV
- Mycenae :**
- Capital from, X
  - Columns from, X
  - Fragments of Façade, XIII
  - Grave Circle at, 45
  - Lion Gate at, IX, XI
  - Tomb of Agamemnon, 49, XIV
  - Tomb of Clytemnestra, XII
- Mylasa, Tomb at,** LXII
- Myra, Tomb at,** XVII
- Naucratis, Capital from Temple of Apollo at,** 108
- Naxian, Votive Column,** XXVIII
- Neandria :**
- Temple at, 70
  - Proto-Ionic Capital from, 17
- Nemea, Temple of Zeus at,** XLVIII
- Olympia :**
- Heraeum at, 65, XV
  - Philippeum at, 148
  - Temple of Zeus, 112, XXIV, XXX
  - Terra-cotta facings from, 95
- Orchomenus :**
- Ceiling of Tomb at, XIII
  - Circular Huts at, 16
- Paestum :**
- Basilica at, 83, 84, XVII
  - Temple of Demeter, 85
  - Temple of Poseidon, XXII
  - Temples at, 83
- Palatitzia, Palace at,** 186
- Pergamum, Great Altar at,** LXII
- Phaestus :**
- Palace at, 29
  - Theatral Area, VII
- Piraeus, Arsenal at the,** 155
- Priene :**
- Houses at, 184
  - Plan of, LXIII
  - Temenos at, 168
  - Temple of Athena, 140, XLIX
  - Theatre at, LXIV
- Proto-Doric Entablature,** 29
- Rhamnus, Temple of Nemesis,** 88
- Sardis, Temple of Artemis Cybele,** 142, XLVIII
- Segesta, Temple at,** XXIII
- Selinus :**
- Temples at, 22, 23, XVII, XVIII
  - Megaron on the Acropolis at, 63
- Stele, Cypriote,** XVI
- Stele of Antiphanes,** 96
- Sunium, Temple of Poseidon,** III, XXXVII
- Syracuse :**
- Olympieum at, 78
  - Temple of Apollo, 78, 79
  - Temple of Athena, 93
- Tamossos, Door jamb of Tomb at,** XVI
- Tegea, Capital from,** LII
- Thermum :**
- Entablature from Temple of Apollo, XV
  - Temple of Apollo, 64
- Tiryns :**
- Approach to Inner Gate, IX
  - Megaron at, VIII
  - Palace at, 34
  - Wall-gallery at, XII
- Troad, Temple of Apollo Smintheus in the,** 163
- Troy, Palace in the second city of,** 31
- Xanthus :**
- Nereid Monument at, 151
  - Tomb of Payava, 74

# INDEX

	PAGE		PAGE
Aahmes (Amasis) II ....	98, 103	Alexandria Troas, Baths	182-183
Abacus .... 27, 41, 53, 67, 77, 87, 114,	115, 120	Alinda, Stoa, 176-178; Theatre	181
Acanthus 114-115, 148, 149, 153, 164		Altars .... 22, 34, 62, 84, 94, 157,	
„ Column, Delphi ....	149, 154		168-169
Achaeans.... 11-12, 47, 57, 58, 69		Amasis (Aahmes) II ....	98, 103
Acræ, colonised .... .... ....	59	Amorgos, House urn	.... 16
ACRAGAS, colonised, 6, 59; destruc-		Amphiprostyle ....	.... 127, 162
tion, 137; S. Maria dei		Ancones ....	.... 93, 121, 124
Greci (Temple of Athena?)		Ancyra, Temple of Augustus and	
89; situation, 89-90; Tem-		Roma ....	.... 166
ple of Asclepius, 162; Tem-		Angle capitals (Ionic)	102, 126, 130
ple of Castor and Pollux, 90,		Angora. See Ancyra	
91; Temple of Concord, 90,		Anta (see also Pilaster)	17, 32, 35, 36-
91; Temple of Hephaestus,		37, 38, 66, 69, 80, 83, 134, 136	
90, 91; Temple of Hera		„ capitals	84-85, 130, 139-140,
Lacinia, 89, 91; Temple of			145, 146
Heracles, 90, 91; Temple		Antefix ...	66, 149
of Zeus Olympius, 90-91,		Anthemion ....	84, 104, 107, 130, 144
162; Tomb of Theron	170-171	Antigonus, Portico of, Delos	.... 169
Acropolis, Acragas, 89; Athens,		Antioch (Pisidian), Sanctuary of	
42-43, 87-88, 94, 132-133,		Men Ascaenus	.... 23
166; Selinus ....	79	„ (Syrian), Colonnaded	
Acroterion (see also Final)	66, 97, 111,	streets	.... 175
	153	Antiochus III the Great....	.... 161
Adler, F.....	.... 53, Fig. 59	„ IV Epiphanes	162, 164
Aegae, Proto-Ionic capital, 71;		Antiphanes, Stele of, Athens	.... 97
Stoa, 178; Theatre	.... 181	Antiphellus, Tombs	.... 75
Aegean culture ...	8, 9-56	Antoninus Pius, 181; Temple of,	
Aegina, Aegean settlement, 12;		Sagalassus	.... 166
Temple of Aphaea ....	88	Aphaea, Temple of, Aegina	.... 88
Aeolians ....	.... 57, 58, 70	Aphrodisias, Stadium, 182;	
Aeolic capitals. See Capitals		Temple of Aphrodite	164, 165
Aesculapius. See Asclepius		Aphrodite, 60; Temple of, Aph-	
Aezani, Stadium, 182; Temple		rodisias	.... 164, 165
of Zeus, 164; Theatre	180-181	Apollo, 60; Statues of, 113, 146;	
Agamemnon, 46; Tomb of,		Temple at Bassae, 110, 112-	
Mycenæ ....	48-53, 67	117, 120, 136; Temple at	
Agora ....	20, 172, 174, 175-179	Corinth, 87; Temple at	
Agoracritus (sculptor) ....	.... 110	Delos, 60, 121; Temple at	
Agrigentum. See Acragas		Delphi, 60, 106, 139; Tem-	
Agrippa, Pedestal of, Athens	.... 166	ple at Didyma, 103, 143-	
Alcamenes (sculptor) ....	110, 126	146; Temple at Metapon-	
Alea, epithet of Athena....		tum, 84, 85; Temple at Nau-	
Alexander the Great 99, 138, 147, 160		cratis, 103-104; Temple at	
		Selinus, 79, 83-84, 85, 121;	

PAGE	PAGE
Temple at Sminthe, 163 ; Temple at Syracuse, 77-78 ; Temple at Thermum, 63-64, 68	
Apollo Epicurius, Temple of, Bassae 110, 112-117, 120, 136	
Apse . . . . . 16-17, 62	
Apteros, epithet of Nike	
Arch . . . . . 15, 178, 181 “ of Hadrian, Athens . . . . . 165	
Archaic period . . . . . 7, 8, 76-107	
Architects (Ancient). See Calli- crates, Callimachus, Chersi- phron, Cossutius, Demetrius, Eupolemus, Hermogenes, Ictinus, Libon, Metagenes, Mnesicles, Paeonius, Philon, Polyclitus, Pythius, Saty- rus, Scopas, Theodorus, Vit- ruvius, Xenocles, Zeno.	
Architrave, 68, 85, 102, 127, 131 ; sculptured . . . . . 86, 150	
Argive Heraeum, Aegean settle- ment, 13, 42 ; Temple of Hera (later), 126 ; Temple of Hera (older), 60, 64 ; Tho- los tomb . . . . . 48, 51	
Argos . . . . . 42	
Armenoid stock . . . . . 11	
Arne. See Gla	
Arrephoroi . . . . . 130	
Arris . . . . . 101, 104, 106, 121	
Arsenal, Piraeus. .... 154-156	
Artemis, 60 ; Altar at Magnesia, 169 ; Temple at Eleusis, 162-163 ; Temple at Ephe- sus, 60, 80, 99-103, 140-142 ; Temple at Magnesia, 163 ; Temple at Sardis . . . . . 60, 142-143	
Artemis Brauronia, Precinct of, Athens . . . . . 134	
“ Leucophryene, Altar of, Magnesia, 169 ; Tem- ple of, Magnesia . . . . . 163	
“ Propylaea, Temple of, Eleusis . . . . . 162-163	
Artemisia. .... . . . . 150	
Aryans . . . . . 10	
Asclepius, Temple at Acragas, 162 ; Temple at Epidaurus 139	
Ashlar masonry . . . . . 41, 175, 178, 181	
Asia Minor. See Aegae, Aezani, Alexandria Troas, Alinda, Ancyra, Antioch (Pisidian),	
Antiphellus, Aphrodisias, Aspendus, Assos, Cnidus, Colophon, Didyma, Ephesus, Erythrae, Euromus, Hali- carnassus, Hierapolis, Ilium, Laodicea, Larissa, Magnesia, Miletus, Mylasa, Myra, Neandria, Patara, Perga, Pergamum, Phocaea, Pin- ara, Priene, Sagalassus, Sardis, Side, Sinope, Sminthe, Smyrna, Telmes- sus, Teos, Termessus, Tralles, Troy, Xanthus, Lycians, Lydians, Phrygians.	
Asine, Aegean settlement . . . . . 42	
Aspendus, Theatre . . . . . 181	
Assembly hall (Thersilion), Mega- lopolis . . . . . 156	
Assos, Agora, 176 ; Temple of Athena, 86, 109 ; Theatre... 180	
Astarte . . . . . 60	
Astragal . . . . . 26, 53, 104	
Athena, 60 ; Altar at Priene, 169 ; Statues of, 110, 112, 118, 125, 126, 133 ; Temple at Acragas (? S. Maria dei Greci), 89 ; Temple at Assos, 86 ; Temples at Athens, 60, 87-88, 110, 114, 117-125, 126-131, 133, 134, 136 ; Temple at Pergamum, 162 ; Temple at Priene, 139-140 ; Temple at Syra- cuse, 92 ; Temple at Tegea 138-139	
Athena, Alea, Temple of, Tegea 138-139	
“ Lemnia, Statue of, Athens 110	
“ Nike, Temple of, Athena 120, 126-127, 134	
“ Parthenos, Statue of, Athens . . . . . 110, 112, 118, 125	
“ Polias, Altar of, Priene, 169 ; Stoa of, Perga- num, 169 ; Temple of, Athens (see Erechtheum), 114, 128 ; Temple of, Pergamum, 109, 162 ; Temple of, Priene, 139-	
140	
“ Promachos, Statue of, Athens . . . . . 110, 133	

PAGE	PAGE
Athenians, Colonnade of, Delphi, 106; Treasury of, Delphi . . . . .	97
ATHENS, Acropolis in general, 94, 132-133, 166; Acropolis walls, 42-43, 87-88; Aegean palace, 37, 43; Aegean settlement, 13; Aegean walls, 42-43; Arch of Hadrian, 165; Beule Gate, 149-150, 166-167; Choragic columns, 180; Choragic monument of Lysicrates, 104, 147-149; Choragic monument of Nicias, 149-150, 167; Choragic monument of Thrasylus, 150; Culmination of Greek architecture in, 108-110, 117-136; Erechtheum, 104, 114, 120-121, 127-131, 136, 149, 166; Fall of Athens, 137; Ionic votive capitals, 70, 105; Library of Hadrian, 165; Odeum of Herodes Atticus, 150, 181-182; Odeum of Pericles, 135; Old Temple of Athena, 87, 133; Older Parthenon, 87-88; Olympieum, 88, 121, 164-165; Parthenon, 110, 117-125, 136; Pedestal of Agrippa, 166; Pinacotheca, 134; Precinct of Artemis Brauronica, 134; Propylaea, 33, 68, 121, 133-134, 136, 166, 167-168; Sack by Sulla, 135; Sanctuary of Pandrosus, 178; Sanctuary of Thesus, 126; Stadium, 158-159; Statue of Athena Lemnia, 110; Statue of Athena Parthenos, 110, 112, 118, 125; Statue of Athena Promachos, 110, 133; Stele of Antiphanes, 97; Stele of Dexileos, 153-154; Stoa of Attalus II, 178-179; Temple of Athena Nike, 120, 126-127, 134; Temple of Hephaestus, see Theseum; Temple of Roma and Augustus, 166; Temple of	Zeus Olympius, 88, 121, 164-165; Temple on the Ilissus, 127; Theatre of Dionysus, 134-135, 147, 148, 149, 150, 157-158, 180; Theseum, 125-126, 136; Tomb, see Stele; Tower of the Winds 179-180
Athens Museums . . . . .	9, 27, 52, 53, 105, 125, Fig. 35
Atlantes (Telamones) . . . . .	90
Atreus, Treasury of, Mycenae . . . . .	48-53, 67
Attalus II, Stoa of, Athens	178-179
Attic . . . . .	150, 152 " base. See Bases.
Attica, Culmination of Greek architecture in	108-110, 117-136
Auditorium . . . . .	135, 157-158, 181
Augustus . . . . .	165 " and Roma, Temple at Ancyra, 166; Temple at Athens . . . . .
Aurelius, Marcus . . . . .	166, 162
Ayaklı. See Euromus.	
Bacchus. See Dionysus.	
Bacon, F. H. . . . .	176; Fig. 27, 76
Baeza (Spain), Columns . . . . .	27
Barrel-vault . . . . .	16, 32, 158, 171
Bases, Aegean, 26, 33, 34, 35, 37, 43; Attic, 129, 144; Doric, 90; Ionic, 72, 100, 181, 139, 143-144, 163, 164	
Basilica, 176; at Paestum . . . . .	67, 84-85, 121
Bassae, Temple of Apollo Epicurius . . . . .	110, 112-117, 120, 136
Baths . . . . .	23, 36, 159, 182-183
Beehive tombs. See Tholos tombs.	
Beni-Hasan (Egypt), Columns . . . . .	67
Benoit, F. . . . .	7
Berlin Museum . . . . .	52, 169; Plates XLIX, LX, LXII
Beule, E. . . . .	166
Beule Gate, Athens	149-150, 166-167
Bibliography . . . . .	201-211
Blegen, C. W. . . . .	37
Blouet, A. . . . .	53
Bohn, R. . . . .	Plate XLV
Borrmann, R. . . . .	7

PAGE	PAGE			
Bouleuterion . . . . .	176	Cephalenia, Aegean settlement	13	
Branchidae. See Didyma.		Ceres. See Demeter.		
Brauronia, epithet of Artemis		Chaeronea, Battle of	137, 160	
Brick, Use of . . . . .	15, 26, 27, 28, 31-32, 36, 39, 62, 63, 66, 69, 175, 184	Chalia, Aegean settlement	. . . 13	
Bridges . . . . .	20, 43	Chamber tombs . . .	46-47	
Bronze, Use of . . . . .	11, 50, 53, 61, 98, 107, 111, 114, 126, 147, 149	Chersiphron (architect) . . .	102	
Bryaxis (sculptor) . . . . .	150	Chipiez, C. . . . .	34, 35, 53, Fig. 39	
Buhlmann, J. . . . .	Plate LIII	Chousy, A. . . . .	7, 148	
Bulle, H. . . . .	Fig. 2	Choragic monuments . . . . .	147-150, 180	
Bulls, Sanctuary of, Delos	169-170	Chresmographion . . . . .	145	
Bury, J. B. . . . .	12	Chronological list of Greek temples . . . . .	before 187	
Butler, H. C. . . . .	142-143	Chronological memoranda . . . . .	. . . . .	
Buttresses . . . . .	15, 31, 66, 113	Chrysapha, Stele at . . . . .	. . . . . 80	
Byzes of Naxos (sculptor) . . .	103	Chryselephantine statues . . . . .	61, 110, 112, 118, 126	
Cadmus . . . . .	13	Cimon . . . . .	. . . . . 126	
Callicrates (architect) . . . . .	110, 117, 126	Circular buildings . . . . .	14, 15-16, 19, 30, 31, 46-54, 135, 147-149, 166	
Callimachus (sculptor) . . . . .	110, 114	Cist graves . . . . .	. . . . . 44, 46	
Camarina, colonised, 59; destroyed		Cities, Arrangement of . . . . .	89, 171-176	
	137	Clarke, J. T. . . . .	Fig. 27	
Cambridge University . . . . .	167	Claudius Pulcher, Appius . . .	167	
Canalis . . . . .	101, 104, 106	Clepsydra . . . . .	. . . . . 179	
Candia Museum . . . . .	. . . . . 9	Clocks . . . . .	. . . . . 174, 179	
Canted volute . . . . .	114, 158, 171	Clytemnestra, Tomb of, Mycenae		
Capitals, Aegean, 26-27, 34, 41,			48, 51, 53	
53, 67; Aeolic, 71, 107, 114, 179; Bracket, 27, 102, 170;		Cnadians, Treasury of, Delphi . . .	107	
Caryatid, 106; Composite, 164, 181; Corinthian, 110, 113, 114-115, 139, 145, 147- 149, 165, 167, 179-180;			(106 note)	
Doric, 65, 67, 77, 84, 87, 162, 167; hexagonal, 167; Ionic 101-102, 103-104, 105-106, 113, 114, 129-130, 143, 144- 145, 150, 158, 161, 163, 184, 171; octagonal, 179; Proto- Ionic, 27, 70-72, 101, 105; triangular . . . . .	180	Cnidus, Temple, 166; Walls . . .	175	
Carrey, J. . . . .	125	Cnossus, Aegean settlement, 9, 12; Palace of Minos, 9, 20- 27, 29-30; Royal Villa, 30;		
Carthaginians . . . . .	77, 84, 93, 137	Temple fresco, 26, 43; Town mosaic . . . . .	15, 38	
Caryatids . . . . .	106, 107, 128, 130, 154, 167	Cockerell, C. R., 88, 90, 107, 114, 115, 116, 117, 119, 143, 150, 152;		
Castor and Pollux, Temple of, Acragas . . . . .	90, 91		Plate XXXI	
Catana, colonised . . . . .	58	Coffer . . . . .	86, 131	
Cavea. See Auditorium.		Colonnades . . . . .	94, 106, 121, 154, 169, 175, 176-179	
Ceilings . . . . .	51, 66, 68, 72, 88, 91, 115, 116-117, 131, 133, 134	Colophon, Tholos tomb . . . . .	. . . . . 54	
Cella . . . . .	61	Colouring. See Polychromy . . . . .		
		Column, Acanthus, Delphi . . .	149,	
			154; Naxian, Delphi . . .	106
		Columnae caelatae . . . . .	100, 140-	
			142, 144, 175	
		Columns (see also Bases, Capi- tals, etc.), Aegean, 14, 15, 18, 19, 21, 22, 23, 25, 26-27, 28-29, 30, 32, 33, 34, 35, 36, 37, 38, 40-41, 43, 52-53;		
		Corinthian (see also Temples,		

PAGE	PAGE
Corinthian), 113, 139, 145, 147-149, 154, 165, 170, 181, Doric (see also Temples, Doric), 62, 96, 97, 133, 146, 147, 149, 154, 168, 170, 179, 182, 186; double or elliptical, 169, 170, 179; engaged or semi-detached, 83, 90, 113, 128, 139, 147, 148, 158, 162, 166, 170, 178; Ionic (see also Temples, Ionic), 63, 75, 84, 113, 118, 134, 139, 147, 150-152, 154, 155, 158, 165, 166, 167, 168, 169, 170-171, 179, 186; Proto-Doric (Egyptian), 67; superposed (see Superposed); wooden, 14, 15, 18, 23, 25, 26, 27 30, 34, 35, 52, 63, 64, 65, 67	sofa, Phaestus, Pseira, Sitia, Siva, Trypiti, Tylissos, Zakro Crete (see also Minoan culture) 9-14, 20
Composite capitals. See Capitals	Croesus ... .. .. .. 99
Concord, Temple of, Acragas 90, 91	Culmination period ... 7, 108-136
Constantinople Museum .... 153 (Fig. 17, Plate XVI)	Cumae, colonised .... .... 58
Construction .... 93, 115, 121-124, 155-156	Cunei .... .... .... 157
Contraction of angle intervals.... 64 66, 85	Curvature (upward) .... 119, 120
Copper, Introduction of.... 11, 13	Cybele, 59-60; Temple of, Sardis, ... 60, 142-143
Corbelled vaults.... 15-16, 30, 31, 42, 44, 47, 49-50, 54	Cycladic culture .. 10, 11-12, 44
Corcyra, colonised .... 58, 59	Cyclopean masonry ... 40, 41, 42
Corinth, Aegean settlements (see also Korakou, 39; Agora, 176; Baths, 183; destroyed 161; Fountain of Prene, 43, 114; Shaft graves, 44; Temple of Apollo .... 87	Cyprus (see also Paphos, Tamossos) .... 11, 12, 13, 58, 70-71, 72, 75
Corinthian bronze .... 114	Cyrene, colonised .... .... 6
Corinthian order. See Capitals, Columns, Entablature	Cyrrhestes, Andronicus.... 179-180
Corinthian tiles .... .. 156	Damana, Vaulted tomb .... 54
Corinthian War .... 137	Darius .... .... 71, 72, 99, 103
Cornice .... .. 85-86, 127	Daumet, H. .... .... 185, Fig. 83
Cos, colonised .... .... 59	Decastyle... .... .... 143
Cossutius (architect) .... 164-165	Decline, Period of .... 8, 137-186
Cradle or sofa volute ... 145, 168	De Jong, P. .... .... Fig. 10, 11
Cretan sites. See Knossus, Damana, Gournia, Hagia, Triada, Hagios, Onouphrios, Isopata, Juktas, Koumasa, Maleme, Malai, Mochlos, Mouliana, Palaikastro, Pet-	Delian Confederacy 108-109, 138
	Delos, Cave Temple, 44; Houses, 184; Ionic votive capitals, 105; Portico of Antigonus, 169; Sanctuary of the Bulls, 169-170; Situation, 95; Temple of Apollo, 60, 121; Treasuries .... .... .... 96
	DELPHI, Acanthus column, 149, 154; Athenian stoa, 106; Athenian treasury, 97; Cnidian treasury, 107 (106 note); Gymnasium, 159; Massiliote treasury, 107; Naxian column, 106; Siphnian treasury, 84, 106-107; Situation, 94-95, 104; Stoae 106, 169; Temple of Apollo, 60, 106, 139; Tholos .... .... .... 147
	Delphi Museum .... Plates XXVI, XXVIII, XXIX, LIV
	Demeter, 60; Temple at Eleusis (see Telesterion; Temple at Paestum.... .... 84-86
	Demetrius of Ephesus (architect) 142
	Dentil .... 72, 74-75, 127, 130, 140, 145, 149

PAGE	PAGE
Der-el-Bahari (Egypt), Columns, 67	132, 146, 155; Propylaea,
Dexileos, Stele of, Athens 153-154	Greater, 167-168; Propylaea, Lesser, 167; Temple
Diana. See Artemis . . .	of Artemis Propylaea 162-163
Diazoma . . . . . 158	Eleusinian limestone 112, 129
Didyma, Temple of Apollo . 103, 143-146	Elis, Agora 176
Dilettanti, Society of . . . . . 168	Enclosures of Greek temples 94
Dimini, Aegean settlement, 13; Houses . . . . . 19	Engaged columns 83, 90, 113, 128, 139, 147, 148, 158, 162, 166, 170, 178
Diminution of Columns. See Tapering . . . . .	Enneastyle 84, 100, 104, 114
Dionysius . . . . . 137	Entablature, Corinthian, 149; friezeless Ionic, 72, 73, 130, 140, 152, 169; mixed Doric- Ionic, 167, 179
Dionysus, 60; Altar of, 135, 157, Frieze of, 149; Statue of, 150; Temple at Pergamum, 162; Temple at Teos, 163; Theatre of, Athens 134-135, 147, 148, 149, 150, 157-158, 180	Entasis 84, 119, 120, 121, 124
Dipteral . . . . . 99, 104, 140, 143, 152, 163, 164	Ephesus, Agora, 174-175; Baths, 183; City plan, 171, 172- 175; colonised, 58, 98; Library of Celsus, 175; Nymphaeum, 175; Stadium, 182; Temple of Artemis (later), 140-142; Temple of Artemis (older), 60, 80, 99- 103, 139, 140, 172; Theatre, 174, 180
Distyle . . . . . 33, 88, 97, 162, 179	Epicurus, epithet of Apollo
Dodecastyle . . . . . 132, 146	Epidaurus, Bridge, 43; Colonnade, 154; Palaestra, 182;
Domes . . . . . 15-16, 30, 31, 47, 49-50, 54	Situation, 95; Temple of Asklepius, 139; Theatre, 147, 157, 158; Tholos . . . 147
Domestic architecture . . . . . 13-19, 20- 38, 183-186	Epinaos. See Opisthodomus.
Donaldson, T. L. . . . . 53, 119	Epistyle. See Architrave.
Dorians . . . . . 12, 57, 59, 69, 70	Erechtheum, Athens . . . . . 104, 114, 120-121, 127-131, 136, 149, 166
Doric order. See Bases, Capitals, Columns, Temples . . . . .	Erechtheus, Shrine of, Athens (see Erechtheum) . . . . . 128
Doorways 23, 35, 37, 46, 48, 51-53, 66, 69, 80, 84, 91, 107, 113, 130-131, 133	Erythrae, colonised . . . . . 58
Dorfeld, W. . . . . 31, 32, 34, 96 126, 134, 139; Fig. 52, 63, 65	Etruscan tombs . . . . . 156
Durm, J. . . . . 7, 34, 41, 52, 111; Fig. 15, 21, 25, 38	Eumenes II . . . . . 144, 168
Echinus . . . . . 27, 41, 53, 84, 87, 97, 101, 103, 163	Eupolemus (architect) . . . . . 110, 126
Egg-and-tongue-moulding 101-102, 103-104, 105, 163, 171	Euromus (Ayakli), Temple . . . . . 165
Egypt, Greek connexions with, 6, 12, 27, 61, 67, 70, 98, 103- 104; Roman annexation . . . . . 161	Evans, Sir Arthur . . . . . 9, 20, 22, 25
Egyptian columns . . . . . 67, 70	Exedra . . . . . 94, 168, 184
ELEUSIS, Aegean settlement, 13; Hall of the Mysteries or Telesterion (later), 121, 131- 132, 148, 155, 156; Hall of the Mysteries (older), 93- 94; Porch of Philon, 121,	Falkener, E. . . . . 172, 174, 183; Fig. 75
	Fascia . . . . . 72, 73, 102, 130
	Fenger, L. . . . . Plate XXXV
	Fergusson, J. . . . . 141-142
	Finial . . . . . 147, 149, 179
	Flutes . . . . . 30, 52, 72, 101, 104, 106, 121, 124, 149, 162

	PAGE		PAGE
Fougères, G. .... ..	80	Delphi, Dimini, Eleusis, Elis, Epidaurus, Gla, Hagia, Marina, Korakou, Lebadea, Lianokladi, Megalopolis, Menidi, Messene, Mideia, Mycenae, Nauplia, Nemea, Olympia, Orchomenus, Pal- atitza, Piraeus, Pylos, Rakhmani, Rhamnus, Rini, Sesklo, Sparta, Spata, Stratos, Sunium, Tegea, Thebes, Thermum, Thor- icus, Tiryns, Tsangli, Vaphio, Zygouries	
Fourth century ... .	8, 137-159	Guilloche . ....	130, 131
Frieze, Absence of, 72, 73, 130, 140, 152, 169; sculptured, 75, 86, 107, 110, 115, 124- 125, 126, 127, 136, 145, 149, 150, 152, 169, 179; triglyph, 27, 35, 53, 66, 68, 78, 85, 162, 167, 169, 179		Guttae .. . ....	68
Funerary architecture ..	44-45, 71, 73-75, 97, 150-154, 156, 170-171	Gymnasium . .	159, 182-183
Gandy-Deering, J. P. .	131, Plate LVIII	Gynaecomitis . . .	185
Gardner, P. .... ..	111, 119	Hadrian, 162, 165; Arch of Athens, 165; Library of, Athens . . . .	165
Gates (see also Propylaea) ..	33, 39, 40-41, 42, 149-150, 166-167	Hagia Marina, Aegean settle- ment .. . ....	13
Gela, colonised, 59; destroyed, 137; terra-cotta exports .	96	Hagia Triada, Palace, 30, 38; Tholos tomb . . .	47
Geloans, Treasury of, Olympia .	96	Hagios Onouphrios, Tholos tomb	47
Geographical notes . .	5-6	Halicarnassus, Mausoleum . .	150- 152, 170
Gerkan, A. von .	Plate LXIII	Hall, H. R. . . .	12
Girgenti. See Acragas.		Hall of the Mysteries (Teleste- rion), Eleusis . . .	93-94, 121, 131-132, 146, 155, 156
Gla, Aegean settlement, 13; Palace, 37; Walls ..	42	Haller, Baron . .	88, 116
Gods. See Antoninus Pius, Aphaea, Aphrodite, Apollo, Artemis, Asclepius, Astarte, Athena, Augustus, Castor and Pollux, Concord, Cybele, Demeter, Dionysus, Erechtheus, Hephaestus, Hera, Heracles, Hermes, Mother of the Gods, Pan- drosus, Poseidon, Rhea, Roma, Serapis, Theseus, Zeus.		Hamdy Bey . . .	152-153
Gournia, Aegean settlement, 12; House tomb, 54; Palace 30, 38		Harland, J. P. . . .	12
Graeco-Roman period . .	8, 161	Hearth . . . .	17, 22, 31, 33, 35, 36, 38
Granicus, Battle of the ....	160	Hecatompedos Naos . . .	118
Grave circle, Mycenae . .	45-46	Hellenadic culture . .	10, 11-12
Greek islands. See Aegina, Amorgos, Cephalenia, Cor- cyra, Cos, Crete, Cyprus, Delos, Ithaca, Leucas, Melos, Naxos, Paros, Rhodes, Samos, Seriphos, Siphnos, Syra, Thera.		Hellenistic period . .	8, 160
Greek mainland sites. See Argive Heraeum, Argos, Asine, Athens, Bassae, Chalia, Chrysapha, Corinth,		Hemeroscopion, colonised . .	6
		Henderson, A. E. . . .	102, Plate L
		Hephaestus, 60; Statue of, Athens, 126; Temple at Acragas, 90, 91; Temple at Athens . . . .	125-126
		Heptastyle . . . .	90
		Hera, 60; Statue of, Argive Heraeum, 126; Temple at Acragas, 89, 91; Temple at Argive Heraeum, 60, 64,	

PAGE	PAGE
126; Temple at Olympia, 64-66, 68-69; Temple at Samos .....	60, 140
Hera Lacinia, Temple of, Acragas, 89,	91
Heracleidae, Return of the ..	59
Heracles, Temple of, Acragas	90, 91
Heraeum (Temple of Hera), Argive, 60, 64, 126; Olympian, 64-66, 68-69; Samian, ..	60, 104
Hercules. See Heracles.	
Hermes, 60; Statue of, Olympia	66
Hermogenes (architect)	162-163
Herodes Atticus, Odeum of, Athens, 150, 181-182; Stadium, Athens .....	159
Herodotus, cited .....	173
Heuzey, L. ....	185
Hexastyle .....	64, 65, 77, 79, 80, 84, 86, 87, 91, 92, 96, 111, 113, 125, 126, 128, 133, 139, 149, 162, 165, 166, 168
Hierapolis, Theatre .....	181
Himera, Battle of, 77; colonised, 58; destroyed .....	137
Hippias ....	88
Hippodrome ....	159
Hissarlik. See Troy.	
Historical notes ....	7-8, 9-12, 57-59, 76-77, 98-99, 108-109, 137-138, 160-161
Hittorff, J. I. ....	79-80, 161
Hoffer, J. ....	119
Homer, cited .....	32, 36, 49
Homolle, T. ....	Fig. 62
House tombs .....	14, 54
Houses, Aegean, 13-19, 31; Greek .....	19, 183-185
Hulot, J. ....	80
Hymettian marble .....	154
Hypaethral .....	88, 111, 115, 132, 143, 165
Hypostyle .....	93
Ictinus (architect) .....	94, 109, 112, 117, 131-132
Ilissus, Temple on the, Athens....	127
Ilium (Troy) ....	13
Impluvium .....	112, 113, 115
Inclinations .....	119, 120, 123-124
Inscriptions .....	154-155
Ionians .....	38, 57, 58, 70, 98-99
Ionic order. See Bases, Capitals, Columns, Temples.	
Iron, Use of .....	124
Isopata, Vaulted tomb .....	42, 54
Issus, Battle of the .....	160
Italy. See Cumae, Locri, Metapontum, Naples, Paestum, Pompeii, Rhegium, Rome, Sybaris, Tarentum; Etruscans.	
Ithaca, Palace of Odysseus .....	38
Ittar, S. ....	53
Jackly. See Euromus.	
Juktas, Mt., Sanctuary .....	43
Juno. See Hera.	
Jupiter. See Zeus.	
Kakovatos. See Pylos (Triphylian).	
Karnak (Egypt), Columns .....	67
Kawerau, G. ....	Plate XV
Koldewey, R. ....	79-80, 176; Fig. 23, 26, 32
Kolumdado. See Nape.	
Korakou (Corinth), Aegean settlement, 13; Houses	16, 18
Koumasa, Tholos tomb .....	47
Labrouste, H. ....	85
Labyrinth .....	26
Lacinia, epithet of Hera.	
Lacunaria. See Coffer.	
Laodicea-ad-Lycum, Stadium, 182; Theatre .....	181
Larissa, Proto-Ionic capitals .....	71
Lebadea, Temple of Zeus .....	162
Lemnia, epithet of Athena .....	
Leochares (sculptor) .....	150
Leontini, colonised .....	58
Lesbos. See Messa, Mitylene, Nape.	
Lethaby, W. R. ....	141
Leucas, Aegean settlement, 13; Cist graves .....	46
Leucophryene, epithet of Artemis	
Lianokladi, Aegean settlement, 13; Houses....	17
Libertini, G. ....	Plate LXI
Libon (architect) .....	110, 111
Library of Celsus, Ephesus, 175; of Hadrian, Athens .....	165

PAGE	PAGE
Lighting of Greek temples ... 88, 111, 115-116, 132, 143, 165	
Light-wells ... 14, 16, 23, 25, 36	
Limestone, Eleusinian ... 112, 129 " Use of 5, 26, 79, 111, 115	
Lion Gate, Mycenae 40-41, 67, 73, 74	
Locri Epizephyrii, colonised, 98 ; Temple ... ... 104	
London, British Museum 52, 53, 75, 99, 100, 101, 115, 139, 140-141, 150-152, 168 ; Fig. 18, 38 ; Plates XIII, XXVII, XXXVIII, XLIX, LI	
Loviot ... ... Plate LV	
Lycian tombs ... 72, 73-75, 156	
Lycians ... ... 73, 98	
Lycurgus ... ... 158	
Lydian tombs ... ... 73	
Lydians ... ... 58, 73, 98	
Lysicrates, Monument of, Athens 104, 147-149	
Lysimachus ... ... 173	
Macedonian Wars ... ... 161	
Macedonians ... ... 137, 161	
Maeander ... ... 144	
Magsa, House ... ... 14	
Magnesia-ad-Maeandrum, Altar of Artemis Leucophryene, 169 ; Stadium, 182 ; Temple of Artemis Leucophryene, 163 ; Theatre ... ... 180	
Maleme, Vaulted tomb ... ... 54	
Malia, Aegean settlement, 13 ; Palace ... ... 30	
Marathon, Battle of ... 77, 99	
Marble, Use of 5, 12-13, 61, 102, 106, 111, 112, 113, 115, 129, 154, 157	
Markets ... ... 176	
Marquand, A. ... ... 7	
Martial, cited ... ... 150, 170	
Masonry. See Ashlar, Cyclopean, Polygonal, Rusticated masonry.	
Massilia, colonised ... 6, 98	
Massiliotes, Treasury of, Delphi 107	
Mausoleum, Halicarnassus 150-152, 170	
Mausolus ... ... 150	
Megalopolis, Theatre, 157, 158 ; Thersilion ... ... 156, 158	
Megara Hyblaea, colonised ... 59	
Megaron ... 19, 31, 33, 34-35, 36, 37, 38, 62, 68-69, 184	
Melos (Phylakopi), Aegean settle- ment, 11, 12 ; House urn, 16, 18 ; Houses, 15, 17 ; Palace, 38 ; Walls ... ... 40	
Menidi, Aegean settlement, 13 ; Tholos tomb ... 53, 54, 55	
Messa, Temple ... ... 164	
Messene, Stadium ... ... 158	
Messina. See Zancle.	
Metagenes (architect) ... ... 102	
Metals. See Bronze, Iron.	
Metapontum, Tavole Paladine, 86 ; Temple of Apollo 84, 85	
Metopes, 68, 78, 85 ; painted, 64 ; sculptured ... 80, 97, 110, 111, 124, 125-126	
Metroum, Olympia ... ... 139	
Midas, Tomb of, Phrygia ... 73	
Mideia, Aegean settlement ... 13, 42	
Miletus, 99, 103 ; Aegean settle- ment, 12 ; City plan, 171 ; colonised, 58 ; Temple of Apollo. See Didyma.	
Minerva. See Athena.	
Minoan culture ... 9-13, 14-15, 20- 30, 38, 43-44, 47, 54	
Minos ... ... 9, 12	
Minyans ... ... 11	
Mitylene, Proto-Ionic capital ... 71	
Mnesicles (architect) 110, 127, 133	
Mochlos, Aegean settlement, 12 ; House tomb ... ... 54	
Monopteral ... ... 166	
Mother of the Gods, Temple of, Olympia ... ... 139	
Mouldings ... ... 121	
Mouliana, Vaulted tomb ... ... 54	
Mummius, Lucius ... ... 161	
Munich Museum ... 52, 88	
Murray, A. S. ... ... 140-142	
Music hall. See Odeum.	
Mutule ... ... 68, 82	
MYCENAE, Aegean settlement, 11, 13 ; Bridge, 43 Cham- ber tombs, 18, 46-47 ; Grave circle, 45-46 ; Lion gate, 40-41, 67, 73, 74 ; Palace, 32-33 ; Shaft graves, 44-46 ; Temple, 32, 33 ; Tholos tombs, 47-53, 55, 67 ; Walls 39, 40-41	

	PAGE		PAGE
Mycenaean culture	9-13, 14, 15-	of the Gods (Metroum),	139,
19, 20, 30-37, 39-43, 44-54, 55-56,	69	Temple of Zeus, 60, 111-112,	
Mylasa, Corinthian column, 165 ;	170	118, Treasuries .. .	96
Tomb	170	Olympieum (Temple of Zeus	
Myra, Theatre, 181, Tomns	73, 75	Olympius), at Acragas, 90-	
Naos. See Cella, Hecatomedos		91, 162 ; at Athens, 88, 164-	
Nape (Kolumnado) Proto-Ionic		165 ; at Syracuse .. .	77-78
Capital	71, 72	Olympius, epithet of Zeus.	
Naples, colonised	58	Opaiion .. .	88, 116, 132
Naples Museum .. .	Fig. 38	Opisthodomus, 61, 83, 118 ;	
omission of .. .	83, 86, 139	Opisthonaos. See Opisthodomus	
Naucratis, colonised, 6, 98 ; Tem-		Optical refinements 112-113, 119-121	
ple of Apollo .. .	103-104	Orchestra .. .	135, 157, 180
Nauplia, Aegean settlement, 13 ;		Orchomenus, Aegean settle-	
Tombs .. .	18	ment, 13, Houses, 16 ;	
Naxian column, Delphi	106	Palace, 37 ; Tholos tomb	
Naxos, Aegean settlement	12	50, 51, 55	
,, (Sicily), colonised	58	Order. See Doric, Ionic order	
Neandria, Temple	18, 71	Orientation of temples 61, 113, 127	
Nemea, Temple of Zeus .. .	139	Orthostates .. .	66, 69, 80
Nemesis, Temple of, Rhamnus		Paeonius of Ephesus (architect) 142	
88, 121, 126		,, of Mende (sculptor) .. .	111
Nenot .. .	Fig. 74	PAESTUM, Basilica, 67, 84-85,	
Neolithic age .. .	10-11, 14	121 ; Temple of Demeter,	
Neptune. See Poseidon.		84-86 ; Temple of Poseidon	
Nereid Monument, Xanthus	86, 150	92-93	
New York, Metropolitan Mus-		Paintings .. .	21, 22, 25, 32, 35, 43,
eum .. .	71, 143 ; Plate XVI	64, 154, 161	
Newton, Sir C. T. .. .	150	Palaces, Aegean, 20-38 ; Greek	
Nicias, Monument of, Athens		185-186	
149-150, 167		Palaeolithic age .. .	10
Niemann, G. .. .	Fig. 60	Palaestra .. .	182
Nike Apteros. See Athena Nike.		Palaikastro, Aegean settlement,	
Nymphaeum, Ephesus .. .	175	12 ; House tomb .. .	54
Octagonal buildings	179-180	Palatitza, Palace .. .	185-186
Octastyle .. .	79, 100, 104, 118, 140,	Palermo Museum 80, Plate XVIII	
143, 163, 164		Palmette .. .	71, 97, 115, 145, 171
Odeum .. .	135, 150, 181-182	Panathenaic frieze .. .	125
Odysseus, Palace of, Ithaca	38	Pandrosus, Sanctuary of, Athens	128
Olbia, colonised .. .	6	Paphos .. .	60
OLYMPIA, Aegean settlement,		Papworth .. .	116
13 ; Gymnasium, 182 ;		Parapet, 112, 178, 179 ; sculp-	
Heraeum, 64-66, 68-69 ;		tured .. .	127
Houses, 16 ; Ionic capitals,		Parascenia .. .	158
171 ; Palaestra, 182 ; Phi-		Parian marble .. .	61, 106
lippeum, 147 ; Situation,		Paris, Louvre Museum	
94-95 ; Stadium, 158 ; Stoa		Plates LI, LII	
Poecile or Echo Colonnade,		Paros, Aegean settlement, 11 ;	
154 ; Temple of the Mother		Houses .. .	16
		Parthenon, Athens	87-88, 110,
			117-125, 136

PAGE	PAGE
Parthenos, epithet of Athena.	
Patara, Theatre	181
Pausanias, cited	
46, 50, 64, 65, 66, 95, 103, 111, 112, 114, 117, 125, 126, 127, 129, 130, 133, 134, 135, 139, 147, 176	
Payava, Tomb of, Xanthus	75
Pedestals, 106, 112, 118, 166, 168, 178; sculptured	141-142, 143
Pediments, sculptured	88, 97, 107,
110, 111, 125, 126, 127, 150	
Peloponnesian War	137
Pennethorne, J. ....	119
Penrose, F. C. ....	111, 119, 121, 123, 164, 165
Pentastyle	....
....	63
Pentelic marble	.. 61, 112, 113, 129
Perga, Stadium, 182; Theatre....	181
PERGAMUM, Altar of Zeus, 144, 168-169; annexed to Rome, 161; Stoa of Athena Polias, 169; Temple of Athena Polias, 109, 162; Temple of Dionysus, 162; Theatre, 180; Vaulted tumulus	.. 171
Péripole	....
....	7, 108-109, 110
Peripteral	....
....	62
Peristyle	.. 28, 36, 62, 183, 184-185, 186
Perrot, G.	....
....	34, 35, 57
Persepolis, Palace and tomb of	
Darius, 72; Persian capitals	71
Persians	.. 71, 77, 87, 88, 99, 108, 135, 137-138, 160
Petssofa, Sanctuary	....
....	43
Phaeustus, Aegean settlement, 12, 20; Palace	.. 23, 27-29, 30
Phidias (sculptor)	....
110, 117, 125	
Phigalia. See Bassae.	
Philon of Eleusis (architect)	132,
146, 155	
Philip of Macedonia	....
147, 160	
Philippeum, Olympia	....
147	
Phocaea, colonised	....
58	
Phoenicians	..
....	58, 59
Phrygian tombs	....
73, 156	
Phrygians	..
58, 59, 73, 98	
Phylakopi. See Melos.	
Piers	....
14, 15, 22, 28, 91, 168, 170	
Pilasters (see also Antae)	.. 145,
168	
Pinacotheca, Athens	....
....	134
Pinara, Theatre	181; Tombs
Praeaus, Arsenal	....
154-156	
Pisistratus	....
88, 105, 164	
Pit graves	....
44-46, 51	
Plataea, Battle of	....
....	77
Plinth	....
139, 143-144	
Pliny, cited	....
101, 140-142, 150-152	
Plutarch, cited	....
132, 135	
Podium	.. 75, 142, 148, 150-151, 167, 168-169, 170
Polias, epithet of Athena.	
Pollux. See Castor.	
Polychromy	.. 15, 26, 33, 35, 46, 52, 66, 79-80, 88, 106, 107, 153
Polyclitus the Elder (sculptor)	111, 126
Polyclitus the Younger (archi- tect)	....
....	147, 157
Polygonal masonry	41, 126, 175
Pompeii, colonised, 58; Ionic capitals, 171; roof tiles	....
111	
Pontremoli, E. ....	169, Plate XLIX
Poseidon, 60; sea and trident mark, Athens, 127, 128-129; Temple at Paestum, 92-93; Temple at Sunium	....
....	126
Poseidonia. See Paestum.	
Posticum. See Opisthodomus.	
Praxiteles (sculptor)	....
....	66
PRIENE, Altar of Athena Polias, 169; City plan, 171-172; Houses, 184; Pedestals, 168; Propylaeum, 168; Temple of Athena Polias, 139-140; Theatre	....
....	180
Primitive period	....
....	8
Private houses, Aegean, 13-19, 31; Greek	....
....	19, 183-185
Prodromus	....
....	16, 18
Promachos, epithet of Athena.	
Pronaos	....
....	36, 61, 62, 69
Proportions (see also Chronologi- cal list of Greek temples) of columns, 67, 77, 83, 86, 87, 92, 101, 126, 129, 136, 139, 162, 165; of plans, 65, 77, 80, 82, 83, 86, 87	
Propylaea	....
28, 33, 36, 68, 121, 133-134, 136, 166, 167-168	
Propylaea, epithet of Artemis.	
Propylon	....
21, 32, 33, 34, 36	

## INDEX

	PAGE		PAGE
Proscenium . . . . .	158, 180	Root construction . . . . .	115, 155-156
Prostyle . . . . .	79, 84, 127, 128	Roof tiles . . . . .	66, 88, 102-103, 111, 115-116, 156, 159
Proto-Doric columns (Egyptian) . . . . .	67	Roofs, Forms of . . . . .	13-18, 32, 35, 37, 46, 75, 88, 147, 149, 181-182
Proto-Ionic capitals See Capitals.		Rotunda. See Tholos.	
Prytaneum . . . . .	176, 186	Rusticated masonry . . . . .	178, 181
Pseira, Aegean settlement . . . . .	12	Sagalassus, Temple of Antoninus	
Pseudo-dipteral . . . . .	83, 143, 163, 164	Pius . . . . .	. . . . . 166
Pseudo-peripteral . . . . .	90, 166	Salamis, Battle of . . . . .	77, 99
Pteroma . . . . .	80, 82, 83	Samos, 98, 99; Temple of Hera . . . . .	60, 104, 143
Pteron . . . . .	151, 170	Sanctuaries, Aegean . . . . .	43-44;
Puchstein, O. . . . .	79-80	Greek . . . . .	94-96, 132-133, 166-167
Punic Wars . . . . .	160-161	Sanctuary of the Bulls, Delos . . . . .	169-170
Pylos (Messenian), Aegean		Sarcophagi . . . . .	51, 152-153
settlement, 13; Shaft graves . . . . .	44	Sarcophagus tombs . . . . .	. . . . . 75
Pylos (Triphylian), Aegean		Sardis, captured by Persians, 99;	
settlement, 13; Tholos		Temple of Artemis-Cybele . . . . .	60, 142-143
tombs . . . . .	48, 55	Satyrus (architect) . . . . .	. . . . . 150
Pyramid . . . . .	150, 152, 170	Scamilli impares . . . . .	122, 124
Pythius (architect)		Scene building . . . . .	135, 157, 158, 180-181
Quadriga . . . . .	80, 152	Schliemann, H. . . . .	9, 31, 32, 33, 46
Quarries, Mt. Pentelicus, 61;		Scopas (sculptor) . . . . .	139, 150
Selinus . . . . .	. . . . . 79	Scotia . . . . .	. . . . . 129, 144
Rakhmani, Aegean settlement,		Sculptors. See Agoracritus,	
13; Houses . . . . .	16, 17	Alcamenes, Bryaxis, Calli-	
Reber, F. . . . .	35, 53; Plate IX	machus, Leochares, Paeo-	
Refinements . . . . .	112-113, 119-121	nious, Phidias, Polyclitus,	
Regula . . . . .	. . . . . 68	Praxiteles, Scopas, Timo-	
Reliefs, 40-41. See also <i>Columnae</i>		theus.	
<i>caelatae</i> , Frieze, Parapet,		Sculpture. See Reliefs, Statues.	
Pedestals, Metopes, Stelae.		Secular architecture, Greek . . . . .	134-135,
Religion (see also Gods) . . . . .	43, 59-61	147-150, 154-159, 171-186	
Rhamnus, Temple of Nemesis		Segesta, Temple, 93, 121;	
(later), 121, 126; Temple of		Theatre . . . . .	. . . . . 181
Nemesis (older) . . . . .	. . . . . 88	Seleucidae . . . . .	146, 175
Rhea . . . . .	. . . . . 59	SELINUS, City plan, 171; colo-	
Rhegium, colonised . . . . .	. . . . . 58	nised, 59; destroyed, 137;	
Rhodes, Aegean settlement, 12;		Ionic votive capital, 161;	
colonised . . . . .	. . . . . 59	Megaron, 62; quarries, 79;	
Rini, Aegean settlement, 13;		Temple "A," 79; Temple	
House . . . . .	. . . . . 16	"B," 79, 161; Temple	
Rock-cut tombs . . . . .	18, 46-47, 73-75	"C," 79, 80-82; Temple	
Roma and Augustus, Temple of,		"D," 68, 79, 82-83; Temple	
Ancyra, 166; Temple at		"ER," 79, 83; Temple	
Athens . . . . .	. . . . . 166	"FS," 79, 83; Temple	
Roman repairs . . . . .	128, 130, 132, 143	"GT," 79, 83-84, 85, 121;	
Romans . . . . .	160-161	Temple "O" . . . . .	. . . . . 79, 80
Rome, Capitolium, 165; Portico			
of Cneius Octavius . . . . .	114		

	PAGE
Sepulchral architecture	44-55, 71, 73-75, 97, 150-154, 156, 170-171
Serapis, Temple of, Taormina	162
Seriphos, Aegean settlement	13
Serradifalco, Duca di	79
Sesklo, Aegean settlement, 13;	
Houses	16, 19
Shaft graves	44-46
Shrines	33, 146
Sicily. See Acrae, Agrigentum, Camarina, Catana, Gela, Himera, Megara Hyblaea, Leontini, Naxos, Segesta, Selinus, Syracuse, Taormina, Zancle; Carthaginians.	
Side, Theatre	181
Sidon, 58; Sarcophagi from	152-153
Sima	102, 107, 111
Sinope, colonised	6
Siphnians, Treasury of, Delphi	84, 106-107
Siphnos, Aegean settlement	13
Sitia, Aegean settlement, 12;	
House	16
Siva, Tholos tomb	47
Sminthe, Temple of Apollo (Smintheum)	163
Smith, J. K.	Plate XXX
Smyrna, colonised	58
Smythe, R. H.	Plate XXV
Sparta, Aegean settlement, 13, 39; supremacy of	137
Spata, Aegean settlement, 13;	
Tombs	18
Specifications	154-156
Stadium	158-159, 182
Stage	180-181
Staircases	14-15, 20, 25, 28, 30, 33, 42, 91, 93, 112, 128, 145, 166, 169
Statues (see also Caryatids, Pediments)	59-61, 62, 66, 94, 98, 103, 110, 112, 113, 118, 125, 126, 133, 146, 150, 152, 161, 168
Stelae	45, 80, 97, 153-154
Stereobate	65
Stevens, G. P.	7, 131; Fig. 49
Stevenson, J. J.	152
Stoa	94, 106, 121, 154, 169, 176-179
Stone, Earliest examples of peripteral temples in,	77-
Stucco	26, 33, 35, 46, 79-80, 88, 111
Stylobate	65
Sulla	135, 154, 165
Sunium, Temple of Poseidon	126
Superposed columns	88, 93, 111, 118, 147, 154, 169, 178-179
Susa, Persian capitals	71
Sybaris, colonised	6
Syra, Aegean settlement	13
SYRACUSE, colonised, 6, 58, 59, 77; supremacy of, 137; Temple of Apollo, 77-78; Temple of Athena, 92; Temple of Zeus (Olymp- peum), 77-78; Theatre	181
Syria. See Antioch, Sidon, Tyre; Phoenicians, Seleucidae.	
Taenia	68
Tamossos (Cyprus), Tomb	71
Taormina, Temple of Serapis, 162; Theatre	181
Tapering columns, Downward, 27, 30, 34, 41, 52, 67; Upward	27, 83, 84, etc.
Tarentum, colonised	59
Tavole Paladine, Metapontum	86
Tegea, Temple of Athena Alea	138-139
Telamonies (Atlantes)	90
Telati de Dalt (Balearic Islands), Column	27
Telesterion, Eleusis	93-94, 121, 131-132, 146, 155, 156
Telmessus, Theatre, 181; Tombs	75
Temenos. See Enclosures of Greek temples.	
Temples (see also Gods), Corin- thian, 164-166; Doric, 32, 33, 63-70, 77-93, 111-126, 135-136, 138-139 161-162; Ionic, 70-72, 99-104, 126- 131, 135-136, 139-146, 162- 164, 166; Origin of	61-63, 68

	PAGE		PAGE
Teos, Temple of Dionysus	163	Troy, Aegean settlement, 10, 11-13 ; Houses, 17, 18 ; Palace, 31-32 ; Walls	39-40
Termessus, Theatre	181	Trunnel	68
Terra-cotta	63-64, 66, 68, 96, 103, 156	Trypiti, House	14
Tetrastyle	127, 128, 146, 150, 168, 169	Tsangli, Aegean settlement, 13 ; Houses	15
Theatral area	26	Tumulus	11, 46, 47, 54, 73, 171
Theatres	134-135, 147, 148, 149, 150, 156-158, 180-181	Tylios, Aegean settlement, 12 ; Palace	30
Thebes, Aegean settlement, 13 ; supremacy of	.. 137	Tyre	58
Thebes (Egypt), Columns	67		
Thermum, Aegean settlement, 13 ; Houses, 16, 17 ; Temple of Apollo	63-64, 68	Ukrainians	11, 54
Theron, Tomb of, Acragas	170-171	Ulmann	Plate XLVI
Theodorus of Phocaea (architect)	147		
Thera, Aegean settlement, 13 ; Houses	15	Vaphio, Tholos tomb	51, 55
Thersilion, Megalopolis	156, 158	Varvakeion statuette of Athena	125
Theseum, Athens	125-126, 136	Vault (see also Barrel-vault and Corbelled vaults)	117
Theseus, 13 ; Sanctuary of, Athens	126	Venus. See Aphrodite.	
Thessalian culture	10-11	Victory. See Athena Nike.	
Tholos	147, 166	Vitruvius, cited	68, 88, 101, 110, 114, 119, 122, 124, 135, 143, 161, 163, 165, 167, 182, 184-185
Tholos tombs	14, 47-54	Volute	27, 70-72, 101-104, 105-106, 114, 115, 129-130, 144, 145, 149, 158, 163, 164, 168, 171
Thoricus, Aegean settlement, 13 ; Stoa, 121 ; Tholos tomb	48, 55	Votive capitals and columns	71-72, 94, 105-106, 139, 154, 161
Thrasyllus, Monument of, Athens	150	Vulcan. See Hephaestus.	
Timber. See Wooden columns, entablatures, origin.			
Timotheus (sculptor)	150		
TIRYNS, Aegean settlement, 11, 13 ; Cist graves, 44 ; Doric capital, 87 ; Houses, 31 ; Palace, 30-31, 32, 33-37 ; Tholos tomb, 55 ; Walls	39, 40, 41-42	Wace, A. J. B. ....	12
Tombs, Aegean, 44-55 ; Asiatic, 71, 73-75, 156 ; Greek, 97, 150-154, 170-171		Walls, Aegean, 38-43 ; Greek (see also Masonry)	175
Torus	72, 129, 130, 144	Watt, J. C. ....	Fig. 36
Tower of the Winds, Athens	179-180	Weir, R. S. ....	130, Fig. 64
Tralles, Theatre	181	Wiegand, T. ....	Fig. 56
Transitional period	7, 76-77	Windows	15, 128, 130-131, 134, 177-178
Treasuries	47, 62, 94, 96-97, 106-107	Winds, Tower of the, Athen	179-180
Triglyph frieze, Aegean, 27, 35, 53 ; Greek	66, 68, 78, 85, 162, 167, 169, 179	Wingless Victory. See Athena Nike.	
Tripolje culture	.... 11	Wood, J. T. 99, 140, 172, 174, 175,	183
Tristyle	.... 134, 141	Wooden columns	14, 15, 18, 23, 25, 26-27, 30, 34, 35, 52, 63, 64, 65, 67 ; entablatures, 63, 65, 68, 72, 73-75 ; origin of Doric order, 67-69 ; origin of Ionic order, 70-75 ; origin of Lycian tombs 73-75, 156

## INDEX

241

PAGE	PAGE
Xanthus, Nereid Monument, 86, 150; Tomb of Payava, 75; Tombs . . . . . 74	at Acragas, 90-91, 162; Temple at Aezani, 164; Temple at Athens, 88, 121, 164-165; Temple at Leba- dea, 162; Temple at Nemea, 139; Temple at Olympia, 60, 111-112, 118; Temple at Stratos, 121, 139; Tem- ple at Syracuse .... 77-78
Xenocles (architect) . . . . . 132	Zeus Olympius, Statue of, Olym- pia, 110, 112; Temple at Acragas, 90-91, 162; Tem- ple at Athens, 88, 121, 164- 165; Temple at Syracuse 77-78
Xerxes . . . . . 94, 103, 143, 146	Zoophoros .... .... 102, 107
Xoanon . . . . . 60, 61	Zygouries, Aegean settlement, 13; Houses .... .... 15
Yakhi. See Euromus.	
Zakro, Aegean settlement .... 12	
Zancle, colonised .. . . . . 58	
Zanth, L. . . . . 79-80	
Zeno (architect), 181; Statue of, Olympia . . . . . 110, 112	
Zeus, 59-60; Altar of, Perga- mum, 144, 168-169; Temple	



# A SELECTED LIST OF BOOKS

*relating to ARCHITECTURE  
DECORATIVE & FINE ART*

CONSTRUCTION, PRACTICAL SCIENCE, &c.

*including important Works on BUILDINGS OF ALL LANDS AND PERIODS; INTERIOR DECORATION; FURNITURE; METAL-WORK; CERAMICS; TEXTILES; PAINTING; SCULPTURE; DRAWING; DESIGN; LETTERING; MANUAL ARTS; LIFE OF PAST AGES; COUNTRYSIDE; GARDEN DESIGN; BUILDING PRACTICE; ENGINEERING; &c.*

*published by*

B. T. BATSFORD Ltd.  
94 High Holborn, London

Telephones : Chancery 7383 and 7384

**A HISTORY OF ARCHITECTURE ON THE COMPARATIVE METHOD.** For the Student, Craftsman, and Amateur. By Sir BANISTER FLETCHER, F.R.I.B.A. Seventh Edition, completely re-written. Containing nearly 1000 pages, with about 3500 Illustrations (1560 recently added and nearly 2000 reproduced larger), from Photographs of Buildings of all Countries and Times. Thick medium 8vo, cloth gilt. £2 2s. net.

**A SHORT CRITICAL HISTORY OF ARCHITECTURE.** New Edition, thoroughly revised and enlarged. By G. MAXWELL AYLWIN, F.R.I.B.A. Containing 570 pages with 750 illustrations, Chronological Charts and Glossary. Large crown 8vo, cloth, gilt, 16s. net. Also obtainable in 3 parts as follows : I. THE ARCHITECTURE OF ANTIQUITY AND OF CLASSIC TIMES. II. BYZANTINE, SARACENIC AND ROMANESQUE ARCHITECTURE. III. GOTHIC AND RENAISSANCE ARCHITECTURE. Bound in half cloth, gilt. 6s. net per part.

**A HISTORY OF ARCHITECTURE**

By FISKE KIMBALL, Assistant Professor of Architecture, University of Michigan ; and G. H. EDGEWELL. With 317 Illustrations, chiefly from Photographs, and Plans, Sketches, Drawings of Ornament. 8vo, art linen. 21s. net.

**HOW TO STUDY ARCHITECTURE**

The Evolution of Architecture as the Expression of Phases of Civilisation. By CHARLES H. CAFFIN. Containing 540 pages, with 200 Illustrations from Photographs of striking and beautiful buildings, including examples of Detail and Ornament, and some Plans. 8vo. cloth. 20s. net.

**ESSENTIALS IN ARCHITECTURE**

An Analysis of the Principles and Qualities to be looked for in Buildings. By JOHN BELCHER, R.A. With about 80 Illustrations (mostly full-page) of Old and Modern Buildings. Large crown 8vo, cloth, gilt. 7s. 6d. net.

**THE "HISTORICAL ARCHITECTURE" LIBRARY  
OF STANDARD TEXT BOOKS ON CLASSIC AND RE-  
NAISSANCE ARCHITECTURE.** Comprising 7 Uniform  
Volumes, written by High Authorities, including the Latest De-  
velopments, Historical and Critical, in Light of Recent Research.

**VOL. I. ANDERSON & SPIERS' ARCHITECTURE OF  
ANCIENT GREECE.** Being the first part of "The Archi-  
tecture of Greece and Rome," Rewritten, Remodelled and  
much Enlarged by WILLIAM BELL DINSMOOR, Professor of  
Architecture at the American Academy at Athens, and at  
Columbia University, New York. With over 200 illustrations  
in collotype, half-tone and line. Large 8vo, cloth. 21s. net.

**VOL. II. ANDERSON & SPIERS' ARCHITECTURE OF AN-  
CIENT ROME.** Being the second part of "The Architec-  
ture of Greece and Rome," Revised and Rewritten by  
THOMAS ASHBY, Late Director of the British School at  
Rome. With about 200 illustrations in half-tone and line.  
Large 8vo, cloth. 21s. net. Price for Volumes I and II  
together, each £2 net.

**VOL. III. THE ARCHITECTURE OF THE RENAISS-  
ANCE IN ITALY.** By WILLIAM J. ANDERSON,  
A.R.I.B.A. Revised and Enlarged, with an additional  
Chapter on Baroque and Later Work by ARTHUR STRATTON,  
F.S.A., F.R.I.B.A. With 80 Plates (including 16 in Collo-  
type) and 120 illustrations in the Text. Large 8vo, cloth.  
21s. net.

**THE ARCHITECTURE OF THE RENAISSANCE IN  
FRANCE.** By W. H. WARD, M.A., F.R.I.B.A. Revised  
and Enlarged by Sir JOHN W. SIMPSON, K.B.E., P.P.R.I.B.A.  
Large 8vo, cloth, in two volumes, 21s. net each, or £2 the set.

**VOL. IV. THE EARLY RENAISSANCE (1495-1640).** With  
about 240 illustrations.

**VOL. V. THE LATER RENAISSANCE (1640-1830).** With  
about 240 illustrations.

**VOL. VI. EARLY RENAISSANCE ARCHITECTURE IN  
ENGLAND.** By J. ALFRED GOTCH, F.S.A., P.P.R.I.B.A.  
*New Edition in preparation.*

**VOL. VII. THE ENGLISH HOME FROM CHARLES I.  
TO GEORGE IV.** By J. ALFRED GOTCH, F.S.A.,  
P.P.R.I.B.A. A History of English Domestic Building  
during the Later Renaissance, with about 300 illustrations.  
Large 8vo, cloth, gilt. 30s. net

THE SERIES forms the most comprehensive, up-to-date, and  
finely illustrated yet issued on its subject, and must prove  
indispensable to the Student or Practitioner of Architecture  
and of great interest to the general reader.

## **THE STORY OF ARCHITECTURE**

From the Earliest Ages to the Present Day. By P. LESLIE  
WATERHOUSE, F.R.I.B.A. With Illustrations of the great build-  
ings of all time from Photographs and Drawings, and many  
Diagrams in the Text. Small 8vo, boards, lettered. 6s. net.

## **ELEMENTS OF FORM AND DESIGN IN CLASSIC ARCHITECTURE.**

Shown in Exterior and Interior Motives  
collated from Fine Buildings of all Time. By ARTHUR STRATTON,  
F.S.A., F.R.I.B.A. Presenting in 80 full-page Plates about 600  
motives of Façades, Loggias, Halls, Staircases, etc. Including  
Series of 16 Plates of Classic and Renaissance Compositions and  
Designs. With Introduction, Analytical Account to each Section,  
Descriptive Notes, and Foreword by Prof. A. E. RICHARDSON,  
F.S.A., F.R.I.B.A. 4to., cloth, gilt, 28s. net.

**THE SMALLER ENGLISH HOUSE FROM THE RESTORATION TO THE VICTORIAN ERA, 1660-1840.**  
By A. E. RICHARDSON, F.S.A., F.R.I.B.A., and HAROLD DONALDSON EBERLEIN, B.A. Treating of the Characteristics and Periods of Style; the Evolution of Plan; Materials and Craftsmanship: Roofing, Windows, Ironwork, Fireplaces, Staircases, Wall Treatment, Ceilings. With over 200 Illustrations, many full page, from Photographs and Drawings. Demy 4to, cloth, gilt. 25s. net.

**A HISTORY OF ARCHITECTURE IN LONDON**

Arranged to illustrate the Course of Architecture in England to the Middle of the XVIIth Century, with a Sketch of the preceding European Styles. By WALTER H. GODFREY, F.S.A. Containing 250 Illustrations, with Collotype Frontispiece, and 7 Folding Maps, including an annotated guide to all the Buildings shown. 8vo, cloth, gilt. 10s. net.

**ENGLISH CHURCH FITTINGS, FURNITURE AND ACCESSORIES.**

By the Rev. J. C. COX, LL.D., F.S.A. A Popular Survey, treating of Churchyards, Bells, Fonts and Covers, Pulpits, Lecterns, Screens, Chained Books, Stained Glass, Organs, Plate and other features. With upwards of 250 Illustrations from Photographs and Drawings. 8vo, cloth, gilt. 21s. net.

**ENGLISH CHURCH WOODWORK AND FURNITURE.** A Study in English Craftsmanship down to the Middle of the XVIth Century. By F. E. HOWARD and F. H. CROSSLEY, F.S.A. Illustrating, in over 325 examples from Photographs, the Development of Screens, Stalls, Benches, Font-Covers, Roofs, Doors, Porches, etc., with details of the Carved and Painted Decoration, etc., etc. Second Edition, revised and enlarged (3rd Impression). Crown 4to, cloth, gilt. 35s. net.

**ENGLISH CHURCH MONUMENTS, A.D. 1150-1550.**

By F. H. CROSSLEY, F.S.A. A survey of the work of the old English craftsmen in stone, marble, and alabaster. Containing over 250 pages, with upwards of 350 Illustrations, from special Photographs and Drawings. Crown 4to, cloth, gilt. 22 net.

**MEDIAEVAL ARCHITECTURE IN EUROPE.**

Its Origin and Development. By KINGSLEY PORTER, Architect. Containing 1000 pages of Text, illustrated by 291 Plates from fine Photographs or Drawings. Two vols., large 8vo, buckram, gilt. £3 10s. net.

Vol. I. **THE TRANSITION.** Contents:—Early Christian and Byzantine Periods—Lombardic and Carolingian Beginnings—Study of Origins of Romanesque and Gothic—Principles, etc., of Later Styles.

Vol. II. **EVOLUTION OF THE GOTHIC STYLE.** Contents: Influences of Normandy—The Ile de France—The Culmination—The Flamboyant Style—The Coming of the Renaissance.

**YPRÉS: THE HOLY GROUND OF BRITISH ARMS.** By Lieut-Col. BECKLES WILLSON. A short, interesting Sketch of the History of Ypres, with a vivid account of the five years' fighting in the Ypres Salient. Illustrated by Photographs, Maps, and old Views. 8vo, art paper wrappers. 3s. net.

**ENGLISH HOUSES AND GARDENS IN THE XVIIth and XVIIIth CENTURIES.** A Series of 61 Bird's-eye Views from the Engravings by KIP, BADES LADE, LOGGAN, etc. Selected, with Introductory and Descriptive Notes, etc., by M. E. MACARTNEY, F.S.A. Oblong 4to, half vellum. 21s. net.

## ENGLISH GOTHIC CHURCHES

The Story of their Architecture. By CHARLES W. BUDDEN, M.A. An easy and handy guide for the amateur to the Parish and Larger Churches of England. Containing 137 pages with 53 full page and smaller line illustrations in the Text from Drawings, Sketches, Plans, etc., and 40 half-tone Plates comprising 80 subjects from Photographs, etc., making 130 illustrations in all. Crown 8vo, cloth, lettered, 7s. 6d. net.

## OLD CROSSES AND LYCHGATES

A Study of their Design and Craftsmanship. By AYMER VALANCE, M.A., F.S.A. With over 200 fine Illustrations from specially taken Photographs, Old Prints, and Drawings. Crown 4to, art linen. 18s. net.

## ENGLISH MURAL MONUMENTS AND TOMB-STONES.

A Collection of Eighty-four Full-page Photographic Plates of Wall Tablets, Table Tombs, and Headstones of the Seventeenth and Eighteenth Centuries, specially selected by HERBERT BATSFORD, for the use of Craftsmen. With an Introduction by W. H. GODFREY, F.S.A. Crown 4to, cloth, gilt. 15s. net.

## THE "COUNTY CHURCH" SERIES

Edited by the Rev. J. C. Cox, LL.D., F.S.A. Twelve volumes, each containing numerous plates from Photographs, and Illustrations from Drawings in the text. Small 8vo, cloth, gilt. 3s. net per volume.

CAMBRIDGESHIRE AND THE ISLE OF ELY. By C. H. EVELYN-WHITE, F.S.A.

CORNWALL. By J. C. COX, LL.D., F.S.A.

CUMBERLAND AND WESTMORLAND. By J. C. COX, LL.D., F.S.A.

ISLE OF WIGHT. By J. C. COX, LL.D., F.S.A.

KENT (2 Vols. sold separately). By F. GRAYLING.

NORFOLK (2 Vols.). Second Edition, revised and extended.

By J. C. COX, LL.D., F.S.A. (*Now out of print.*)

NOTTINGHAMSHIRE. By J. C. COX, LL.D., F.S.A.

SURREY. By J. E. MORRIS, B.A.

SUFFOLK (2 Vols. sold separately). By T. H. BRYANT.

## HEXHAM AND ITS ABBEY

By C. C. HODGES and J. GIBSON. An account of the Town and its Abbey. With 156 pages and 45 Illustrations from Photographs, Prints, and Drawings. Demy 8vo, cloth. 10s. 6d. net.

## OLD ENGLISH COTTAGES AND FARM-HOUSES

A Series of Volumes illustrating minor Domestic Architecture in England. Each contains 100 Photographic Plates, in Collotype, with Descriptive Notes and numerous Sketches. Crown 4to, art canvas, gilt. 36s. net each.

1. KENT AND SUSSEX. Photographed by W. GALSWORTHY DAVIE and described by E. GUY DAWBER. [*Now out of print.*]

2. SHROPSHIRE, HEREFORDSHIRE, AND CHESHIRE. Photographed by JAMES PARKINSON and described by E. A. OULD.

3. THE COTSWOLD DISTRICT. Photographed by W. GALSWORTHY DAVIE and described by E. GUY DAWBER. [*Now out of print.*]

4. SURREY. Photographed by W. GALSWORTHY DAVIE and described by W. CURTIS GREEN.

5. OLD HOUSES AND VILLAGE BUILDINGS IN EAST ANGLIA—NORFOLK, SUFFOLK, AND ESSEX. By BASIL OLIVER. [*Now out of print.*]

## FRENCH PROVINCIAL ARCHITECTURE

As shown in various examples of Town and Country Houses, Shops and Public Places. By PHILIP LIPPINCOTT GOODWIN and HENRY OOTHOVFT MILLIKEN. 60 Plates, reproduced from special Photographs and Measured Drawings, from the earliest Norman type to 1820, printed in Collotype. With Introductory and Descriptive Text. Small folio, half-bound. £3 10s. net.

## THE ELEMENTS OF CLASSIC ARCHITECTURE

AND EXAMPLES OF THE FIVE ORDERS. A Portfolio containing 70 Plates, from Drawings by G. GROMORT, illustrating the Orders, with details of Capitals, Mouldings, Plans and Elevations of Classic and Renaissance Buildings in Greece, Rome, and elsewhere. Titles, etc., in French. Imperial 4to, in portfolio. 25s. net.

## EXAMPLES OF CLASSIC ORNAMENT FROM GREECE & ROME.

From the Originals by LEWIS VULLIAMY. Containing 20 Plates illustrating many fine examples, with Descriptive Notes by R. PHENÉ SPIERS. Folio, in strong portfolio. 12s. 6d. net.

## THE ORDERS OF ARCHITECTURE: GREEK, ROMAN AND ITALIAN.

By R. PHENE SPIERS, F.S.A., F.R.I.B.A. Fifth Edition, Revised and Enlarged. Containing 21 pages of Text, 27 full-page Plates, including 7 specially prepared for this work by the Author, and 12 illustrations in the Text. This Series has for many years established itself as one of the most important works on the Orders, and the Plates are well adapted to use by Students. Large 4to, half-cloth, lettered. 12s. 6d. net.

## CLASSIC ARCHITECTURE

A Series of 10 Plates illustrating typical examples of the Greek and Roman Orders from the Author's specially executed drawings, showing full detail and a selection of Classic Ornament. With a Descriptive Letterpress. An invaluable standard work for Class and Personal Study. Large folio, in Portfolio, 10s. 6d. net; set of 10 Plates without Text or Portfolio, 8s. net.

## LITTLE KNOWN TOWNS OF SPAIN.

A series of water colours and drawings, beautifully reproduced in facsimile colour and monochrome from the originals of VERNON HOWE BAILEY, comprising 67 full-page plates, many in colour, others in sepia, wash, lithography, etc., with text including historical and descriptive short notes. Large 4to, in decorative paper binding, £3 10s. net. Bound in cloth, gilt, £3 16s. net.

The author, as the result of his travels and researches, has produced a work full of fascination and charm, in which are represented many picturesque hill towns, great fortresses, wide rivers, and stately bridges. His bold and vigorous watercolours give a clear-cut impression of the sunlit colour of many small untouched towns and show a very characteristic fresh aspect of Spain.

## RAFFLES DAVISON, Hon. A.R.I.B.A., Draughtsman, Writer and Editor.

A Record of His Life and Work, including a Selection of his Drawings and Sketches. Edited by MAURICE E. WEBB and HERBERT WIGGLESWORTH. A memorial volume issued to commemorate the work of this fine draughtsman, including about 117 of his Architectural, Decorative and Landscape sketches, with appreciations by Sir ASTON WEBB, Sir REGINALD BLOMFIELD, etc., etc. 4to, half-bound. 21s. net.

## **THE ART AND CRAFT OF GARDEN MAKING**

By THOMAS H. MAWSON, Garden Architect, and PRENTICE MAWSON. Fourth Edition, thoroughly revised and much enlarged. With hundreds of Illustrations, full page and smaller, many new to this Edition, in Colour and from Photographs, plans, measured drawings, and sketches of old and modern gardens, features, detail, etc. Including a special revised list of plants and shrubs. Folio, cloth. £3 15s. net.

## **GARDEN CRAFT IN EUROPE**

By H. INIGO TRIGGS, F.R.I.B.A. An Historical Account of European Garden Design, tracing its course from the times of Classic Antiquity to the Nineteenth Century. Containing 330 pages with over 200 Illustrations from Photographs, Engravings, and Drawings, with 13 Collotype Plates. Large imperial 8vo, art linen, gilt. £2 2s. net.

## **GARDENS IN THE MAKING**

By WALTER H. GODFREY. A simple Guide to the Planning of a Garden. With upwards of 70 Illustrations of Plans, Views, and various Garden Accessories. Crown 8vo, cloth. 7s. 6d. net.

## **THE WELL-CONSIDERED GARDEN**

By LOUISA YEOMANS KING. With an Introduction by Miss GERTRUDE JEKYLL. An attractive account of Garden Arrangement and Colour Schemes, containing 50 garden views from special Photographs, and some plans of garden beds. New Edition revised, with further Illustrations. Large 8vo, cloth. 12s. 6d. net.

## **THE OLD GARDENS OF ITALY: HOW TO VISIT THEM.**

By Mrs. AUBREY LE BLOND. An Illustrated Guide-Book for Travellers. With 100 Plates from Photographs specially taken by the Author. Small 8vo, cloth. 5s. net.

## **MAN'S PREHISTORIC PAST**

A Popular Survey of its Scenes, Life and Remains, in the Old World and the New. By Professor H. WILDER, Ph.D. Containing Chapters on River Terraces, etc.; Rock Shelters—Paintings—Lake Villages; Pre-History; Types of Prehistoric Man, etc. With 450 Pages and 110 full-page Illustrations. Large thick 8vo, cloth, gilt. 25s. net.

## **ENGLAND IN TUDOR TIMES**

An Account of its Social Life and Industries. By L. F. SALZMAN, M.A., F.S.A. Author of "English Industries of the Middle Ages," etc. A remarkable survey of a great period in England's Social history. Containing chapters on The Spirit of the Tudor Age—Life in the Country—Life in the Town—Life in the Home—The Church—Adventure on Land and Sea. With 138 pages of text, 64 full-page illustrations and plentiful illustrations in the text from drawings, engravings, etc. Demy 8vo, cloth. 7s. 6d. net.

## **PROVERB STORIES OF MANY LANDS**

By LUCILE BERK. 12 Stories, each written round an historical figure, recounting an adventure, and summed up in a proverb. With 4 full-page Illustrations. Crown 8vo, cloth, lettered. 7s. 6d. net.

## **ROUND THE WORLD IN FOLK TALES**

A Regional Treatment. By RACHEL M. FLEMING. 16 Tales from Iceland, Mexico, Africa, Australia, etc., told in a fresh, easy style. With 17 Illustrations from Prints, Drawings, and Photographs, 8vo, boards. 2s. net. Cloth, 3s. net.

## TOURING ENGLAND, BY ROAD AND BY-WAY

By Sydney R. JONES. A Handy Guide in a New Form to the Beauties of Rural England. Comprising 20 suggested Tours, described with maps and covering the whole of England, illustrated by 54 specially executed pen drawings by the Author and 50 photographic illustrations on 22 plates, making over 100 pictures in all. Indispensable for the Motorist, Cyclist and Tourist on Foot. Crown 8vo, cloth, lettered. 7s. 6d. net.

## THE XVIII<sup>th</sup> CENTURY IN LONDON

An Account of its Social Life and Arts. By E. BERESFORD CHANCELLOR. Containing 280 pages, with 192 Illustrations, printed in sepia, from prints and drawings by contemporary artists. With a Frontispiece in Colour. Crown 4to, cloth, gilt. Now offered at 25s. net.

"From every point of view, literary and artistic, the book is a delight to turn over and to read; and author and publisher alike are to be heartily congratulated on an achievement which is worthy of the best traditions of British book-production."—*The Daily Telegraph*.

*A Companion and sequel to the above.*

## LIFE IN REGENCY AND EARLY VICTORIAN

**TIMES.** An Account of Social Life in the days of Brummel and D'Orsay. By E. BERESFORD CHANCELLOR. A Series of Chapters on the time of Brummel and D'Orsay, 1800-1843. With numerous Illustrations from Rare Prints and Original Drawings. Large 8vo, cloth, gilt. 25s. net.

"A most readable piece of social history."—*Morning Post*:

"Mr. Chancellor writes well . . . We have seldom seen collected together so fascinating a profusion of plates."—*Spectator*.

## THE "ENGLISH LIFE" SERIES

### THE ENGLISH COUNTRYSIDE

By ERNEST C. PULBROOK. A Review of some of its Aspects, Features, and Attractions. With 126 Illustrations from Photographs, including a Frontispiece by A. E. NEWCOMBE. Second edition, revised. Large 8vo, cloth, gilt. 12s. net.

### ENGLISH COUNTRY LIFE AND WORK

An Account of some Past Aspects and Present Features. By ERNEST C. PULBROOK. Containing about 200 pages on Farmers, Old and New—Field-Work—Cottage Folk—The Village Craftsman—Religious Life, etc. With about 200 artistic Illustrations from special Photographs. Large 8vo, cloth, gilt. 16s. net.

"We may congratulate the author on a very readable and well-illustrated book. He has given a fairly detailed description of a large number of occupations of the English country labourer and village dweller. . . . Such industries as thatching and hurdle-making are described at some length, and there are good pages on country methods of trading."—*The Field*.

### OLD ENGLISH HOUSEHOLD LIFE

Some Account of Cottage Objects and Country Folk. By GERTRUDE JEKYLL. Consisting of 17 sections on the Fireplace, Candle-light, the Hearth, the Kitchen, Old Furniture, Home Industries, Cottage Buildings, Itinerants, Mills, Churchyards, etc. With 277 Illustrations from Photographs and Old Prints and Drawings. Large thick 8vo, cloth, gilt. 21s. net.

"None can read it without enjoyment, and few without enlightenment. As to the collector, he must not be without it."—*Illustrated London News*.

### THE ENGLISH INN, PAST AND PRESENT

E. A. E. RICHARDSON, and H. D. EBERLEIN. Treating of the Inn in Mediæval, Tudor, Georgian and Later Times, Interiors, Signs, Coach Travel, suggested Tours, etc. With about 200 Illustrations from Photographs, Prints, Engravings and Drawings by Rowlandson, Hogarth, Pollard, Alken and Shepherd, among other artists. Large 8vo, cloth, gilt. 21s. net.

**THE "PEOPLE'S LIFE AND WORK" SERIES**  
**LIFE AND WORK OF THE ENGLISH PEOPLE**  
**THROUGH THE CENTURIES.** A Pictorial Record from Contemporary Sources. By DOROTHY HARTLEY and MARGARET M. ELLIOT, B.A. (Lond.). Each volume is devoted to a separate century and contains 32 pp. of Text and about 150 pictures on 48 full-page Plates, of Household Life, Crafts and Industries, Building, Farming, Warfare, City and Country Scenes, Transport, Children, Church Life, Gardens, etc. With an Introduction on the characteristics of each period, full Descriptive Notes, Historical Chart, Analytical Index, Music, etc. Large (royal) 8vo, boards, lettered. 4s. 6d. net per volume, or bound in cloth, 5s. 6d. net per volume.

The scheme of the Series is as follows :—

- I. LIFE AND WORK OF THE PEOPLE FROM THE CONQUEST TO 1300.
- II. THE FOURTEENTH CENTURY.
- III. THE FIFTEENTH CENTURY.
- IV. THE SIXTEENTH CENTURY.
- V. THE SEVENTEENTH CENTURY.
- VI. THE EIGHTEENTH CENTURY.

The first two volumes are now ready :—

- LIFE AND WORK IN THE FIFTEENTH CENTURY.  
LIFE AND WORK IN THE SIXTEENTH CENTURY.

"A delightful collection of contemporary pictures largely taken from manuscripts. Of recent years we have had a bewildering output of picture-books, but we do not know of any on such a scale as this, cheap enough to find their way into the actual possession of children."—*The Manchester Guardian*.

#### **"HOME AND WORLD" SERIES.**

8vo. cloth, lettered, 5s. net each; or 4 vols. for 19s. net.

#### **HOW WE ARE FED**

A Geographical Reader. By J. FRANKLIN CHAMBERLAIN, Ed. B., S.B., Containing 32 Short, Bright Talks on : Oyster Farming—A Loaf of Bread—A Rice Field—A Cup of Cocoa—A Cranberry Bog—How Dates Grow, etc. With 93 Photographic Illustrations.

#### **HOW WE ARE CLOTHED**

A Geographical Reader. By J. F. CHAMBERLAIN. Containing 28 Bright Talks on : By the Dykes—Island Dwellers—Where the Raincoat Grows—A Spool of Thread, etc., etc. With 85 Photographic Illustrations, many full-page.

#### **HOW WE ARE SHELTERED**

A Geographical Reader, dealing with Homes in Cliffs ; A Pueblo Home ; Indian Homes ; Life in a Loghouse ; Lumbering ; How Bricks are Made ; etc. With over 70 typical Illustrations from Photographs, many full-page.

#### **HOW WE TRAVEL**

A Geographical Reader. Including 24 chapters on the Making of Roads ; The Variety of Trains in Different Countries ; A Journey in a Jinrikisha ; Travel in China ; Automobiles ; Steamships ; Airships ; How the Mail is delivered ; Wireless, etc. With 60 interesting Photographic Illustrations, many full-page.

#### **ELEMENTARY INDUSTRIAL ARTS**

By L. L. WINSLOW, Specialist in Industrial Training, New York Department of Education. Practical and historical instruction on Book production, Papermaking, Basket-making, Brick, Pottery, Concrete, Textiles, Copper, Iron and Steel, Soap, Glass, Wood, Woodworking, etc. With 335 pages and 187 illustrations from Photographs and Drawings. Demy 8vo, cloth. 6s. net.

**A HISTORY OF EVERYDAY THINGS IN ENGLAND, 1066-1799.** Written and Illustrated by MARJORIE and C. H. B. QUENNELL. In Two Volumes. Medium Svo. 8s 6d. net each; also issued bound in one volume, 16s. 6d. net.

This account of the English People in their everyday life, of their occupations and amusements during seven centuries, may be read with enjoyment by all interested in the life of Great Britain. The book appeals strongly to Students, Designers, and those interested in Building, Decoration, and Costume.

"A model of book production, exquisite in type, in line drawing, in colour printing."—*The Times*.

**Vol. I.—EVERYDAY THINGS IN ENGLAND FROM 1066-1499.** With 90 Illustrations, many full-page, and 3 Plates in Colour. Fourth Impression.

Contents:—NORMAN ENGLAND AND ITS PEOPLE: Conditions before the Conquest—Norman Castles—Monasteries—The Domesday Survey—The Peasantry. ENGLAND IN THE THIRTEENTH CENTURY: Costume—Monks and Pilgrims—Early English Halls and Manor Houses—Warfare in the Middle Ages—Farms and Gardens—Amusements. THE FOURTEENTH CENTURY: Manners, Customs, Food, and Dress—Ships and Sea Battles—Travelling—The Black Death. LIFE IN FIFTEENTH CENTURY ENGLAND: The Merchant Adventurers—Houses and Furniture—Hunting and Jousts—Games, Mysteries and Morris Dancers—Dress, Jewellery, and Ornaments—End of the Mediæval Period.

**Vol. II.—EVERYDAY THINGS IN ENGLAND FROM 1500-1799.** By MARJORIE and C. H. B. QUENNELL. With 4 Coloured Plates and 111 other Illustrations from the Author's Drawings. Third Impression, revised and corrected.

Contents:—THE SIXTEENTH CENTURY: The Reformation—Ships and Sea Power—Effect of the Renaissance on Everyday Things—Homes and Furniture—Costumes—Schools—Games—Hunting and Archery—The Theatre. THE SEVENTEENTH AND EIGHTEENTH CENTURIES: Costume—Ships—Food and Cooking—Gardens—Musical Instruments—Coaches and Sedan Chairs—Characteristics.

*Issue in Parts for Schools and Class Teaching.*

The work is now obtainable in Six Separate Parts, each covering a period of history of about a century, appropriate for a term's study. Each part has its own TITLE, CONTENTS, and FULL INDEX; the ILLUSTRATIONS are all given, and the coloured plates and comparative charts are also included. Bound in stiff paper covers (with the original special design), at 3s. net each part.

**PART I. ENGLAND UNDER FOREIGN KINGS (1066-1199).**

Containing 2 Colour Plates, 5 full-page line Illustrations, and 15 in the Text.

**PART II. THE RISE OF PARLIAMENT (1200-1399).** Containing 2 Colour Plates, 18 full-page Illustrations, and 22 in the Text.

**PART III. THE HUNDRED YEARS' WAR (1400-1499).** Containing 1 Colour Plate, 11 full-page line Illustrations, and 13 in the Text.

**PART IV. THE AGE OF ADVENTURE (1500-1599).** Containing 2 Colour Plates, 16 full-page line Illustrations, and 30 in the Text.

**PART V. THE CROWN'S BID FOR POWER (1600-1699).** Containing 1 Colour Plate, 11 full-page line Illustrations, and 21 in the Text.

**PART VI. THE RISE OF MODERN ENGLAND (1700-1799).** Containing 1 Colour Plate, 11 full-page line Illustrations, and 19 in the Text.

### THE EVERYDAY LIFE SERIES

*A Graphic and Popular Survey of the Efforts and Progress of the Human Race. Now completed in Four Vols. Crown 8vo, cloth. 5s. net. each.*

#### EVERYDAY LIFE IN THE OLD STONE AGE

Written and Illustrated by MARJORIE and C. H. B. QUENNELL. Containing 128 pages, including 70 Illustrations, and a Coloured Frontispiece, from the Authors' Drawings, with a Chronological Chart.

The authors have planned a series on the Everyday Life of Humanity. In this volume they have presented the longest and oldest periods of man as a story full of human interest. We see the animals which man hunted and fought, are carried back to the family life of the cave mouth, and realise the way the old peoples lived, wandered, and vanished. The illustrations show implements; heads of the chief human types; hunting methods; evolution of spears, darts, needles, etc.; early artists, etc.

"A small book containing much substance. . . . A vivid, simple style and sprightly humour—which last is carried even into their clever black-and-white illustrations—should give them many appreciative readers. . . . A most attractive little book."—*The Morning Post.*

#### EVERYDAY LIFE IN THE NEW STONE, BRONZE

AND EARLY IRON AGES. Written and Illustrated by MARJORIE and C. H. B. QUENNELL. Containing 144 pages, with 90 original Illustrations from the Authors' Drawings, of Household Life, Agriculture, Pottery, Weapons, Ornaments, etc., Including 2 Plates in Colour, a marked Map, and a Chronological Chart.

The authors show how these people prepared their food, visualise the early smiths, and the coming of Weaving and the Wheel. There is a careful and interesting account of the life, art, and industry of a Lake Village. The story covers a period rich in human achievement.

*The above two works may now be obtained bound in one handy volume, as described below:*

#### EVERYDAY LIFE IN PREHISTORIC TIMES

Containing 272 pages, 3 Plates in Colour and 2 in Monochrome, with 160 Illustrations from the Authors' Pen and Ink Drawings, two Chronological Charts and a Comparative Map. The Old Stone Age Section has an Account of the Rhodesian Skull and Nebraskan Tooth, with 2 additional Illustrations. Crown 8vo, duxeen, lettered. 10s. net.

#### EVERYDAY LIFE IN ROMAN BRITAIN

Written and Illustrated by MARJORIE and C. H. B. QUENNELL. Containing 128 pages, with over 100 original Illustrations from the Authors' Pen Drawings, of Cities and Camps, Villas, Ships, Chariots, Monuments, Costume, Military Life, Household Objects, Pottery, &c. Including 3 Colour Plates, Chart, and Map of Roads.

The Authors have produced simply and concisely a fascinating picture of the activities of the conquering race, their Towns and Camps, Shops, Churches, Basilicas, Baths, Military Routine, Roadmaking, and of their household life reconstructed from many varied appliances. There is a monograph on Silchester with many original reconstructions, and a chapter on Rome's position in the world empires.

"The illustrations are very good, and add much to the value of the book, which is as entertaining as it is instructive."—*The Westminster Gazette.*

**EVERYDAY LIFE IN ANGLO-SAXON, VIKING AND NORMAN TIMES.** Written and Illustrated by MARJORIE and C. H. B. QUENNELL. Containing 115 pages under three section-headings, with 2 full-page plates in colour and 78 illustrations in pen and pencil, many full-page, of Ships, Cooking, Metal-work, Caskets, Crosses, Buildings, Pottery, Illuminated M.S.S. etc. with an Historical Chart.

This volume, which completes the "Everyday Life Series," gives a vivid picture of the domestic life of these times and an account of such branches of their activity as building, utensils, crafts, art, etc. Crown 8vo, cloth. 5s. net.

"We heartily commend the volume and the series to all teachers."—*The Teachers' World.*

### **THE HOMES OF OUR ANCESTORS**

An Authentic and Intimate Account of the Colonial Period in America, by R. T. H. HALSEY and E. TOWER. Over 300 pages with 20 full-page plates in Colour and 217 from Photographs. Cloth, gilt, paper sides. £3 10s. net.

### **ITALIAN FURNITURE AND INTERIORS.**

A Collection of 200 very fine full-page Plates from Photographs of Italian Interiors and Furniture, both Mediaeval and Renaissance. With descriptive text by GEORGE LELAND HUNTER (New York). Complete in 4 parts. Folio, in handsome cloth portfolio. £12 complete; or in 4 instalments of £3 per Part. Supplied only in complete sets.

The wealth of material still remaining from the sumptuous period of the Italian Renaissance has never hitherto been adequately presented. Mr. Hunter has chosen his examples from the most important private and public collections, and the plates illustrate complete Interiors, with their architectural settings and decorative accessories, as well as fine individual pieces of Furniture, Chests, Chairs, Tables, Cabinets, reproduced to a large scale showing details of workmanship.

### **THE ENGLISH FIREPLACE**

By L. A. SHUFFREY. Illustrated by a series of examples (chiefly Renaissance) on 130 full-page Collotype Plates, from Photographs, with 200 Text Illustrations from Sketches, Measured Drawings, and Photographs. Small 4to, art linen, gilt. £2 10s. net.

### **THE DECORATIVE WORK OF ROBERT AND JAMES ADAM.**

Being a Reproduction of all the Plates illustrating DECORATION and FURNITURE from their "Works in Architecture," published 1778-1812. Containing 30 large folio Plates (size 19in. by 14 in.), giving about 100 examples of Rooms, Ceilings, Chimneypieces, Tables, Chairs, Vases, Lamps, Mirrors, Pier-glasses, Clocks, etc., etc. Large folio, bound in old style. £1 15s. net.

### **RENAISSANCE ITALIAN PLASTERWORK**

By ARDINNO COLASANTI. A Series of 192 fine Plates of large-scale Reproductions of Modelled and Painted Ceilings and Vaults. With brief Italian Introductory Text. Small folio, art linen, gilt. 30s. net.

### **ENGLISH FURNITURE AND DECORATION 1680-1800.**

Illustrated in a Series of Photographic Plates selected and arranged, with brief Introduction by G. MONTAGUE ELLWOOD. With 200 Plates, comprising over 300 Examples of Interiors, Doors, Ceilings, Chimney-pieces, Chairs, Tables, Cabinets, Bookcases, Settees, etc., etc. New Impression. 4to, cloth, gilt. 30s. net.

**ENGLISH DECORATIVE PLASTERWORK OF THE RENAISSANCE.** A Review of its Design from 1500 to 1800. By M. JOURDAIN. Containing in six sections a Complete Survey of Modelled Ornament from the 16th to the 19th century, illustrated by 115 large scale photographic plates, and numerous reproductions of Measured Drawings, Sketches and Old Designs, comprising in all over 250 examples of Elizabethan, Stuart, Georgian and Adam ceilings, friezes, overmantels, panels, ornament, detail, etc. The whole forms an invaluable collection of the finest English Renaissance Modelled Ornament. Medium 4to, cloth, gilt. 30s. net.

"We have nothing but respect for the scholarly and artistic qualities of this book, which should take a permanent place in the library of artistic achievement in England."—OLIVER BRACKETT in *The Observer*.

**THE FOUR VOLUMES OF BATSFORD'S LIBRARY OF DECORATIVE ART**

form an attractive Series of remarkable scope and completeness. It reviews the Development of English Decoration and Furniture during the three Renaissance Centuries, XVI., XVII., and XVIII. (1500-1820). Each volume has an extensive series of Plates, and is a complete guide to the work of its Period.

The division is into three great periods—which may be broadly called Elizabethan; Stuart and Georgian; and Classic, with a separate volume each for Stuart Furniture and Decoration. The volumes are remarkable for the beauty and number of their illustrations, the simplicity and clearness of their arrangement, and their moderate prices. The complete series of four volumes is published at prices amounting to £11 3s., but is supplied for the present at the special price of £10 10s. net.

**EXTRACTS FROM PRESS NOTICES OF THE SERIES**

"These handsome volumes with their extremely fine and copious illustrations provide a full survey of English Furniture and Decoration."—*The Times*.

"While the pages, both printed and pictorial, are scrupulously factful, the authors write with such charm that the reader is able to visualize something of the social life of the period, for the English home is inextricably interwoven with the English character. On the technical side also the volumes are notable. Stately in form, they are models in respect of binding and printing, and the numerous and valuable illustrations are of the highest order of reproduction."—*The Glasgow Herald*.

**BATSFORD'S "LIBRARY OF DECORATIVE ART" (DIVN. I)**

**DECORATION AND FURNITURE IN ENGLAND**

**DURING THE EARLY RENAISSANCE. 1500-1660.** An Account of their Development and Characteristic Forms during the Tudor, Elizabethan and Jacobean Periods, by M. JOURDAIN. Containing 20 Chapters; comprising about 300 pages, and over 200 full-page Plates (with Coloured Frontispiece and some in photogravure), including over 400 Illustrations, from specially made Photographs and Measured Drawings, and from Engravings. With a Foreword by Colonel EDWARD F. STRANGE, O.B.E., Keeper of Woodwork at the Victoria and Albert Museum. Folio (size 14×10½in.), cloth, gilt, £3 net.

After an Introduction on the social life of the period, Miss Jourdain traces foreign influences, and gives a section on all Decorative Features as: Interiors; Colour-Decoration; Panelling and Carving; Doors; Chimney-pieces; Staircases; Ceilings and Decorative Detail in Plaster, Metalwork, Glazing, etc. Under Furniture, the characteristic illustrations show design and form in Tables, Chairs, Cabinets, Chests, Beds, Sideboards, Cupboards, etc.

"A vivid and valuable work on a very interesting period."—*The Manchester Guardian*.

"The material is handled with mastery and sympathy, and the illustrations give exactly what is wanted."—*The Times Literary Supplement*.

"Sumptuous alike in print, paper, and illustrations, it is a delightful possession, and a desirable book of reference."—*The Field*.

## BATSFORD'S "LIBRARY OF DECORATIVE ART" (DIVN. II).

### FURNITURE IN ENGLAND FROM 1660 TO 1760

By FRANCIS LENGYON. A Survey of the Development of its Chief Types. Containing 300 pages with over 400 Illustrations, printed in sepia, from special Photographs, together with 5 in Colours. Second Edition, revised, with many new Illustrations. Folio (14 in.  $\times$  10½ in.), handsomely bound in cloth, gilt. £2 10s net.

Contents :—The Dutch and French Influence, 1660-1715—The Venetian Influence, 1715-1743—The Rococo, Chinese and Gothic Fashions, and the Classical Reactions, 1740-1760—Chairs, Stools, and Settees, with Upholstery—Beds, Cornices, and Curtains—Tables—Bookcases and Cupboards—Pedestals and Brackets, Stands for Cabinets—Mirrors—Clock Cases—Veneer and Marquetry—Gesso—Silver Furniture—Lacquer.

" . . . Like the other works of this series, it is magnificently illustrated. The plates form the finest series of representations of late seventeenth and early eighteenth century interiors and their component parts that have been collected together in any work of a similar character. The examples selected are not only typical, but typical of the best."—*The Connoisseur*.

### DECORATION IN ENGLAND FROM 1640 TO 1760

By FRANCIS LENGYON. A Review of its Development and Features. Containing 300 pages with over 350 Illustrations, of which 133 are full-page, printed in sepia, from special Photographs, and 4 in Colours. Second Edition (third impression), revised, rearranged and enlarged. With many additional illustrations. Folio (14 in.  $\times$  10½ in.) handsomely bound in cloth, gilt. £2 10s. net.

Contents :—Decoration, 1660-1715, 1715-1740, 1745-1770—Woodwork and Panelling—Wood-Carving—Door-Cases—Chimney-pieces—The Hall and Staircase—Decorative Painting—Plaster-work—Firebacks, Andirons and Grates—Door Furniture—Lighting.

" The volume must rank as one of the standard works on the period treated, and there are few, if any, among them so well informed, so exhaustive in their treatment, or so superbly illustrated."—*The Connoisseur*.

" Photographs and plates as perfect as they can be made are grouped in sections following the introduction. The furniture-lover will feel stimulated as his pet weakness and his most cherished style will greet him and wonders beside ready to convert him to other loves."—*The Morning Post*.

## BATSFORD'S "LIBRARY OF DECORATIVE ART" (DIVN. III).

### DECORATION AND FURNITURE IN ENGLAND DURING THE LATER XVIIIth CENTURY, 1760-1820.

An Account of their Development and Characteristic Forms, by M. JOURDAIN. Containing 15 Chapters; comprising about 300 pages, with over 180 full-page Plates (a selection in collotype), including over 400 Illustrations, from specially made Photographs and Measured Drawings, and from Engravings. With a Foreword by Professor A. E. RICHARDSON, F.R.I.B.A. Folio (size 14  $\times$  10½ in) cloth, gilt. £3 3s. net.

Contents: Introduction—Decoration—Interiors—Artists and Craftsmen—Materials and Processes—Decorative Painting—Chimney-pieces—Doors—The Hall and Staircase—Plaster-work—Metal Work—Lighting Fittings—Furniture: Its Development—Materials—Methods and Processes—Types—Metal Fittings.

" This volume has not only to complete a work admirably done, but has to cover the most important ground of all. It is perhaps sufficient to say that the author has risen to the occasion. Many beautiful rooms by the less-known architects are included which have never before been illustrated. Altogether this book is a fine volume on a fine subject never before adequately treated. Professor Richardson supplies an excellent introduction."—Professor C. H. REILLY, F.R.I.B.A., in *The Manchester Guardian*.

## An Illustrated Catalogue of THE LEVERHULME PERMANENT ART COLLECTIONS, comprising Three Sumptuous Monographs by World-famous Authorities

The Volumes are of a Royal Quarto size, sumptuously bound in buckram, gilt, and offered at the exceptionally advantageous price of £15 15s. the set for a limited edition. The volumes will not be sold separately, and can never be reissued once the small number for sale is exhausted.

- I. ENGLISH PAINTING OF THE XVIII<sup>th</sup>, XIX<sup>th</sup>, & XX<sup>th</sup> CENTURIES. WITH SOME EXAMPLES OF OTHER SCHOOLS. By R. R. TATLOCK, Editor of *The Burlington Magazine*. With an Introduction by ROGER FRY. Containing 170 pages, with 127 Plates, including 14 in Photo gravure.
- II. CHINESE PORCELAIN AND WEDGWOOD POTTERY, WITH OTHER WORKS OF CERAMIC ART. By R. L. HOBSON, B.A., Keeper of the Department of Ceramics, British Museum. Containing 230 pages with 103 Plates, including 30 in Full Colour, and a Number of Line Diagrams, Marks, etc.
- III. ENGLISH FURNITURE, TAPESTRY & NEEDLEWORK, WITH SOME EXAMPLES OF OTHER STYLES. By PERCY MACQUOID, R.I., Author of "A History of English Furniture," etc. Containing 170 pages with 116 Plates, including 11 in Full Colour.

## BATSFORD'S COLLECTORS' LIBRARY

A Series of Handbooks written by experts, providing information of practical value to Connoisseurs, Collectors, Designers, and Students. Each volume forms an ideal introduction to its subject, and is fully illustrated by Reproductions in Colour and from Photographs. Svo, cloth, gilt. Price 8s. 6d. net each, excepting the two marked.\*

\*OLD ENGLISH FURNITURE. By F. FENN and B. WYLLIE. With 94 Illustrations. *New Impression*. 10s. 6d. net.  
OLD PEWTER. By MALCOLM BELL. With 106 Illustrations.  
SHEFFIELD PLATE. By BERTIE WYLLIE. With 121 Illustrations.

FRENCH FURNITURE. By ANDRÉ SAGLIO. With 59 Illustrations.

DUTCH POTTERY AND PORCELAIN. By W. P. KNOWLES. With 54 Illustrations.

\*PORCELAIN. By WILLIAM BURTON. With over 50 full-page Plates illustrating 87 fine examples of the Porcelain of Various Countries and Periods. *New Impression*. 10s. 6d. net.

FRENCH POTTERY AND PORCELAIN. By H. FRANTZ. With 77 Illustrations (*Now out of print*).

ENGLISH TABLE GLASS. By PERCY BATE. With 254 Illustrations. (*Now out of print*.)

ENGLISH EMBROIDERY. By A. F. KENDRICK. With 64 Illustrations. (*Now out of print*.)

## MOOT POINTS

Friendly disputes upon Art and Industry between WALTER CRANE and LEWIS F. DAY. 90 pages, with eight amusing Caricatures of the Artists by WALTER CRANE. Demy Svo, in paper wrapper. 1s. 6d. net.

## A HISTORY OF ENGLISH WALLPAPER

From the earliest Period to 1914. By A. V. SUGDEN and J. L. EDMONDSON. Comprising 270 pages on Wallpapers' ancestry—Early Wallpapers—Eighteenth Century Developments—Famous Pioneers—Chinese Papers and English Imitations—Late Georgian Achievements—The Coming of Machinery—How Wallpaper "found itself"—The Coming of William Morris—Developments of Taste and Technique—Mill Records. With 70 plates in colour and 190 Illustrations in half-tone. Large 4to, handsome Art Buckram, Gilt boxed. £3 3s. net.

"The History of Wallpapers was well worth recounting, and the handsome quarto proves to be an even more interesting record than one could have imagined. The production of so handsome a volume has obviously entailed not only much labour, but some generosity, for the purchase price, even over a large edition, would hardly justify so lavish a use of illustrations of this quality.—*The Yorkshire Post*.

## ENGLISH INTERIORS FROM SMALLER HOUSES

OF THE XVIIth TO XIXth CENTURIES, 1660-1820. By M. JOURDAIN. Illustrating the simpler type of Design during the Stuart, Georgian, and Regency Periods. Containing 200 pages, and 100 Plates, comprising 200 Illustrations, from Photographs and Measured Drawings of Interiors, Chimney-pieces, Staircases, Doors, Ceilings, Panelling, Metalwork, Carving, etc., from minor Country and Town Houses. With Introduction and Historical Notes. Large 4to, cloth, gilt. 24s. net.

Contents :—Decoration, 1660-1725. Decoration : Palladian—Rocco. The Classic Revival and Regency, 1760-1820. Proportion of Rooms—Hall and Passage—Windows—The Staircase—Walls—Doors—Chimney-pieces—Ceilings.

"The work is remarkably well illustrated; the plates show details of carving and moulding with great clearness. Miss Jourdain has divided her work into sections, each dealing with a particular feature of the interior, and the illustrations are arranged in chronological order. Her text is always lucid and informative."—*The Connoisseur*.

## THE DECORATIVE ARTS IN ENGLAND, 1660-1780.

By H. H. MULLINER, with an Introduction by J. STARKIE GARDNER. A Series of 110 full-page Plates from Photographs illustrating 256 Specimens of Furniture, Lacquering, Marquetry, and Gesso, Chandeliars, Clocks ; Stuart and Georgian Silver—Sconces, Cups, Bowls, Tea and Coffee Sets—Enamels, Locks, Battersea Enamel, Ormolu Vases, Tapestry, Needlework, Bookbindings. With brief Historical Introductions and full descriptions. Folio, half-parchment, gilt. £3 10s. net.

"Sumptuously printed and lavishly illustrated, emphatically one of the few books that really count in the collector's library."—*The Observer*.

## OLD ENGLISH FURNITURE

Its Characteristics, Features, and Detail from Tudor Times to the Regency. For the use of Collectors, Designers, Students, and Others. By J. T. GARSIDE. I. THE OAK PERIOD, 1500-1630. Containing 30 Plates reproduced from the Author's specially prepared Drawings illustrating about 400 details of Table Legs ; Bed-posts ; Corbels ; Finials ; Turned Feet ; Carved Friezes ; Moulded Capitals ; Panels : Linenfold, Carved, Arched, Geometrical ; Inlay Motives, Metal Fittings, etc. Including also Drawings of type-pieces of the period and a Series of 20 Photographic Illustrations. With an Historical Introduction, Accounts of each type of Piece and Feature, and Descriptive Notes. 8vo, cloth, gilt. 10s. 6d. net.

"The volume explains the styles and characteristic details with a conciseness, precision, and wealth of graphic illustration that cannot but repay attention. The book admirably serves the purposes of a reader out to train his eye in recognising form."—*The Scotsman*.

## COLOURED ORNAMENT OF THE HISTORIC STYLES.

A Series of 180 fine Plates in Three Parts, from the Original Water-Colours by ALEXANDER SPELTZ.

PART I. THE CLASSIC ERA (Prehistoric, Egyptian, Middle-East, Cretan, Greek, Etruscan, Roman, Buddhist, and Early Christian Ornament).

PART II. THE MIDDLE AGES (Byzantine, Russian, Celtic, Romanesque, Scandinavian, Spanish, French, English, Netherland, Italian and German Gothic Ornament).

PART III. THE RENAISSANCE PERIOD (Ornament of the Italian, French, English, German, and Flemish Renaissance, Grotesque and Rococo, Classic and Empire Styles, etc.).

Each Part contains 50 pages of Text and 60 Plates showing about 350 subjects, well reproduced in colour and mounted on semi-stiff boards. Three volumes, in stout cloth portfolios with flaps, large 4to, 30s. net each volume or £4 4s. the set. Also obtainable bound, in 3 volumes, stout buckram, 35s. net per volume, or £5 the set.

## THE STYLES OF ORNAMENT

From Prehistoric Times to the Middle of the XIXth Century. A Series of 3500 Examples Arranged in Historical Order, with Descriptive Text. By ALEXANDER SPELTZ. Revised and Edited by R. PHENÉ SPIERS, F.S.A., F.R.I.B.A. Containing 560 pages, with 400 full-page Plates exhibiting upwards of 3500 separate Illustrations. Large 8vo, cloth, gilt. 20s. net.

MR. WALTER CRANE, in a lengthy review in the *Manchester Guardian*, wrote: ". . . To pack into a single volume of some 626 pages and 400 illustrations a really intelligible account of the styles of ornament prevailing in the world from prehistoric times to the middle of the nineteenth century is a REMARKABLE FEAT. . . The illustrations are for the most part well chosen and characteristic, and are drawn with decision and facility."

## A HANDBOOK OF ORNAMENT

With 3000 Illustrations of the Elements and the Application of Decoration to Objects, e.g. Vases, Frets, Diapers, Consoles, Frames, Jewellery, Heraldry, etc., and grouped on over 300 Plates, reproduced from the Author's specially prepared drawings. With Descriptive Text to each subject. By Professor F. SALES MEYRER. Large 8vo, cloth, lettered. 16s. net.

"IT IS A LIBRARY, A MUSEUM, AN ENCYCLOPÆDIA, AND AN ART SCHOOL IN ONE. To RIVAL IT AS A BOOK OF REFERENCE ONE MUST FILL A BOOKCASE. The quality of the drawings is unusually high, and the choice of examples is singularly good. . . The text is well digested, and not merely descriptive or didactic, but an admirable mixture of example and precept. So good a book needs no praise."—*The Studio*.

## A HISTORY OF ORNAMENT.

In 2 Volumes. Large 8vo, cloth, gilt. 24s. net each; or 2 vols. 45s. net.

I. ANCIENT AND MEDIÆVAL. By A. D. F. HAMLIN. An Account of the Decorative Arts in Primitive, Classic, Byzantine, and Mediæval Times, to 1500. Containing upwards of 800 Illustrations, from Photographs and Drawings, including 22 special full-page Plates (400 Figures), 7 in Colour, showing Details, Metal-work, Furniture, Textiles, Mouldings and Tracery, Pottery, etc.

II. RENAISSANCE AND MODERN. By A. D. F. HAMLIN. Decoration in Italy, France, Spain, the Netherlands, and England from 1500 to the 20th century. With 50 full-page Plates from Photographs and Drawings, comprising 150 Illustrations, and about 280 line Illustrations, etc., and a series of 23 Plates, 4 in Colour, illustrating 350 figures of Detail.

"The book fulfils its purpose as forming a concise and well-proportioned introduction to the history of the rise and development of Renaissance ornament."—*The Connoisseur*.

## THE ART WORKERS' STUDIO

A Periodical Publication of Art, Old and New. Each Part contains about 20 Plates, finely produced in Colour, from the Decorative Art of Historic Periods and from the Designs of Modern Artists. The Series includes Decorative Designs; Ceramic Work; Embroideries; Enamels; Textiles; Mural Decoration; Carpets; Inlay; Tapestry, etc., and from the quality and variety of the Designs should prove indispensable to Schools, Designers, Manufacturers, Decorative Artists, Collectors, and Amateurs of Art. Large 4to in an Ornamental Paper Cover, 12s. 6d. net each part; the complete year containing 4 parts. £2 10s. net.

Nos. 1-6 now available separately. Volume xxvii, comprising Nos. 1-4, New Series, bound in cloth, £2 15s. net.

- A SHORT HISTORY OF ART FROM PREHISTORIC TIMES TO THE XIXTH CENTURY.** Translated from the French of Dr. ANDRÉ BLUM. Edited and Revised by R. R. TATLOCK. Illustrated by 128 full-page Photographic Plates, comprising about 250 examples of the finest Painting, Sculpture, Architecture, and Decorative Art of Early, Classic, Byzantine, Gothic, Renaissance, and Recent Times. Including also about 80 Illustrations in the Text from Drawings, Engravings, and Plans. Medium 8vo, cloth, gilt. 21s. net.

- A MANUAL OF HISTORIC ORNAMENT**

An Account of the Development of Historic Architecture and Decorative Art for students and Craftsmen. By RICHARD GLAZIER. Fourth Edition, revised and enlarged, containing 700 illustrations, chiefly from the author's original drawings with various new plates to this edition and an additional series of half-tone plates. Royal 8vo, cloth, lettered. 12s. 6d. net.

"It is now the ideal manual for the student and craftsman for in it he can trace the phases and developments of the art of all nations, from remote times up to the present day."—*The Decorator*.

### BURLINGTON MAGAZINE MONOGRAPH—I.

#### CHINESE ART.

Now out of print. Further volumes in preparation.

The first volume on CHINESE ART is now out of print. Copies can be occasionally supplied for 35s. net.

### BURLINGTON MAGAZINE MONOGRAPH—II.

#### SPANISH ART

An Introductory Review of Architecture, Painting, Sculpture, Textiles, Ceramics, Woodwork, Metalwork, by ROYALL TYLER, Sir CHARLES HOLMES and H. ISHERWOOD KAY, GEOFFREY WEBB, A. F. KENDRICK, B. RACKHAM and A. VAN DE PUT, BERNARD BEVAN, and P. DE ARTINANO, respectively. With a General Introduction by R. R. TATLOCK, Editor of *The Burlington Magazine*, and about 280 large scale illustrations. Published under the Direction of *The Burlington Magazine*, the book combines in one volume a study of the Art of Spain in all its branches by the foremost authorities on the subject. Royal 4to, cloth. £2 2s. net.

"A rich book, both in the multitude of its illustrations and as a concise encyclopaedia of information."—*The Daily News*.

#### OLD MASTER DRAWINGS

A quarterly magazine for Students and Collectors. Edited by K. T. PARKER, Print Room, British Museum. Each number contains 16-20 plates of little-known drawings by great masters from Museums and Private Collections all over the world, with articles and notes on each by the best-known authorities. Demy 4to, 5s. 6d. net, post free each number. Annual Subscription 21s. net, post free.

Nos. 1, 2, 3, and 5 now available separately. Volume I, comprising first four numbers, bound in cloth, 25s. net.

## **EARLY FLEMISH PAINTINGS IN THE RENDERS**

**COLLECTION.** Exhibited at the Flemish Exhibition, Burlington House, January 1927. With an Introduction by G. HULIN DE Loo and Descriptions of the Paintings by EDOUARD MICHEL. Containing 6 Mounted Plates in Full Colour and 18 Plates in Photogravure of paintings in the Collection of M. Renders of Bruges, including intensely interesting and little-known works by such Masters as Rogier van der Weyden, Memling, Jean Provost, Mabuse, etc., etc. Large 4to, in Portfolio. £3 3s. net, or bound in cloth, gilt, £3 10s. net. Edition strictly limited to 300 copies. "With the book in his hands he will be a dull reader indeed who cannot in a comparatively short time familiarise himself with several distinct aspects of the history of Flemish paintings."—*The Daily Telegraph*.

## **THE SIGNIFICANCE OF THE FINE ARTS**

A Review of the Development of Architecture and the Decorative Crafts. Containing : Classical and Mediæval Architecture; The Renaissance; Modern Architecture; Sculpture; Painting; Landscape Design; City Planning; The Industrial Arts; and Music. By C. HOWARD WALKER, RALPH ADAMS CRAM, H. VAN B. MAGONIGLE, LORADO TAFT, F. L. OLMS TED, and others. 482 pages, illustrated by about 250 Works of Art from Photographs and Drawings. Large 8vo., cloth, gilt, 18s. net.

## **MURAL DECORATIONS OF POMPEI**

By PIERRE GUSMAN. A Series of 32 full-page Plates, finely printed in Colour in facsimile of the Author's water-colours. Comprising about 50 examples of the finest and most typical Pompeian colour-work. 4to, in portfolio. £2 10s. net.

## **HISTORIC TEXTILE FABRICS**

By RICHARD GLAZIER. Containing : Materials—The Loom—Pattern—Tapestries—Dyed and Printed Fabrics—Church Vestments, etc., with about 100 Plates from Photographs and from the Author's Drawings, including 4 in Colour, and 43 Line Diagrams, illustrating over 200 varieties of Textile Design. Large 8vo, cloth, gilt. 21s. net.

The book should be in the hands of all artists, teachers, students, designers, and salesmen, and the general public would be the richer for a close study of such an admirable work, which will bring about a greater appreciation of the work of the past and have a stimulating effect upon work of the present and the future."—*Journal of the Textile Institute*.

## **POPULAR WEAVING AND EMBROIDERY IN SPAIN.**

By MILDRED STAPLEY. Including Chapters on Plain and Fancy Weaving, Tassels and Fringes, Appliqué, Embroidery: White, Black-and-White, and Coloured; Drawn-work, Filet Lace, etc. Illustrated by 3 Plates in Colour, and 118 from Photographs, comprising upwards of 150 examples, chiefly of the XVI-XVII<sup>th</sup> Centuries. With 20 Diagrams of Stitch Workings. Small 4to, art canvas, gilt. 32s. net.

## **FLORAL FORMS IN HISTORIC DESIGN**

Drawn by LINDSAY P. BUTTERFIELD, Designer, with Introduction and Notes by W. G. PAULSON TOWNSEND. Containing 30 Plates in Collotype and Line, showing about 100 Decorative Adaptations of the Rose, Carnation, Fruit Blossom, etc., from Eastern and European stuffs, and from old Herbals. Large folio, in portfolio, 15s. net.

## **COSTUME.**

By KATHERINE M. LESTER, Director of Art Instruction, Public Schools, Peoria, Ill. Illustrated by ILA M. MACAFEE. 244 pages and about 100 Illustrations from Sculpture, Gems, Vases, Tapestries, etc. With Frontispiece in Colour. Octavo, cloth, lettered. 12s. 6d. net.

*A Panorama of Three Centuries of Fashionable Dress*

## HISTORIC COSTUME

A Chronicle of Fashion in Western Europe, 1490-1790. By FRANCIS M. KELLY and RANDOLPH SCHWABE. Containing the chief characteristics of Dress in each century. Illustrated by some hundreds of full-page and text Sketches from original sources by RANDOLPH SCHWABE of typical groups, figures, and details. Including 7 Plates specially reproduced in Colour, and 70 Photographic reproductions of Historic Pictures, Portraits, Scenes, etc. Large 8vo, cloth, gilt. 25s. net.

"Intended primarily for the costumier, film producer, and artist, it is full of delight for the ordinary reader, who will find it an excellent help in the pleasant game of trying to construct a livelier vision of the past."—*The Queen*.

## THE REGIONAL COSTUMES OF SPAIN

An Illustrated Review of the National and Traditional Dress of her Provinces. By ISABEL DE PALENCIA. Treated under 32 section-headings, with 4 plates in colour and 241 illustrations in half-tone on 186 Plates from actual photographs, Paintings by well-known artists, old prints, etc. The whole forms a complete gallery of Spanish Peasant Costume which should appeal to all interested in the Decorative Arts. Large 8vo, cloth, lettered. 28s. net.

## A CENTURY OF FRENCH FASHION AND COSTUME (1800-1900).

A Miniature Portfolio of 80 Plates, coloured by hand, giving a panorama from the Regency to present times, in 4 complete quarter-century sections. Square 8vo, in small portfolio, artistic boards. 20s. net.

## BATIKS AND HOW TO MAKE THEM

By PIETER MIJER (New York). With 20 full-page Plates from Photographs of ancient Javanese and modern Dutch and American Batiks, and of Tools and Equipment, etc. Imperial 8vo, cloth. 10s. 6d. net.

## DESIGNS FOR SWISS FILET LACE

(*Les Dentelles de Gruyère*). Containing 36 full-page Collotype Plates with over 100 designs, by the lace makers of Gruyère in Switzerland, in historic and modern styles. Oblong 4to, stiff paper covers, lettered. 14s. net.

## OLD DUTCH POTTERY AND TILES.

By ELIZABETH NEURDENBURG. Translated by BERNARD RACKHAM. With 112 Illustrations, of which 8 are in Colour, of Drug Jars, Bowls, Jugs, Vases, Tile Pictures, and single examples in various Styles, in Delft and other renowned Dutch Wares. With Chapters on all chief Varieties and Factories, Lists of Marks, Bibliography, etc. A Limited Number of Copies offered at a very advantageous reduced figure. Thick 4to, linen, gilt. £4 4s. net; offered for £2 2s. net.

## MASTERPIECES OF ORIENTAL RUGS

By W. GROTE-HASELBALG, translated by G. BARRY GIFFORD. Illustrated in 120 finely Coloured Plates of carpets, prayer rugs, vshaks, tentbags, etc., from Asia Minor, the Caucasus, Russia, Turkestan, China and elsewhere. With a brief Illustrated Introduction and full analytical and Descriptive Notes. 3 Vols. 8vo, Text half-bound and Plates in portfolios. 25s. net.

## THE RYIY RUGS OF FINLAND

By U. T. SIRELIUS. A Comprehensive Account of the History of these famous Finnish Rugs, their Technique, Decorative Devices, Design, etc. With 93 full-page plates in Colour and 334 illustrations in the Text, mainly from Photographs. Large 4to, cloth, lettered. £2 10s. net.

**FURNITURE OF THE PILGRIM CENTURY,  
1620-1720.** Including Utensils and Metalwork. By WALLACE  
NURTING. With 600 Illustrations, showing 1000 pieces  
of Furniture, specially photographed. With Descriptive Notes.  
Large thick 4to, cloth, gilt. £2 15s. net.

**ENGLISH IRONWORK OF THE XVIIth AND  
XVIIIth CENTURIES.** By J. STARKIE GARDNER. Containing  
330 pages, with over 250 Illustrations, including 80 Collotype  
Plates, and numerous Measured Drawings, Sketches, and Photo-  
graphs. Crown 4to, art linen, gilt. £2 10s. net.

**ENGLISH AND SCOTTISH WROUGHT IRON-  
WORK.** By BAILEY Scott MURPHY, Architect. Containing  
80 fine Plates (size 21½in. by 14½in.), 68 reproduced from Measured  
Drawings, and 12 from Photographs specially taken. With  
Descriptive Text. Imperial folio, buckram, gilt. £4 4s. net.

**ENGLISH LEADWORK : ITS ART AND HISTORY**  
A Book for Architects, Antiquaries, Craftsmen, and Owners and  
Lovers of Gardens. By Sir LAWRENCE WEAVER, F.S.A. Contain-  
ing 280 pages, with 441 Illustrations from Photographs and Draw-  
ings. Large 4to, art linen, gilt. 30s. net.

**AN ILLUSTRATED HISTORY OF ENGLISH  
PLATE,** Ecclesiastical and Secular, illustrating the Develop-  
ment of Silver and Gold Work of the British Isles from the earliest  
known examples to the latest of the Georgian Period. By Sir  
CHARLES JAMES JACKSON, F.S.A. With a Coloured Frontispiece,  
76 Plates finely executed in Photogravure, and 1500 other Illus-  
trations, chiefly from Photographs. Two volumes, small folio,  
bound in half-morocco. £10 10s. net.

### **ART FOR AMATEURS AND STUDENTS**

By GEORGE J. COX, A.R.C.A. Containing Chapters on Art and  
Life, The Essentials of Art, Art Structure in Minor Arts, In Archi-  
tecture, In Sculpture, In Painting, etc. With 36 Plates containing  
over 250 illustrations reproducing works of Decorative and Fine Art  
of every kind in a comparative manner. Large 4to, cloth, paper  
sides. 21s. net.

### **DRAWING, DESIGN AND CRAFTWORK**

For Teachers, Students, and Designers. By FREDK. J. GLASS.  
Containing 240 pages, with over 1840 Illustrations on 140 Plates,  
from Drawings by the Author. 2nd Edition, revised and enlarged,  
with additional illustrations. Demy 8vo, cloth. 12s. net.

"Mr. Glass's book is very comprehensive, embracing practically every kind of art work  
that is likely to be attempted in elementary or secondary schools, and ranging from  
simple drawing to various forms of craft work. The book is lavishly illustrated, and its  
general get-up reflects the utmost credit on all concerned."—*The Journal of Education.*

### **SIMPLE STITCH PATTERNS FOR EMBROIDERY**

By ANNE BRANDON JONES. A helpful little treatise on the  
embellishment of everyday objects by easy stitch patterns in bright  
colours. The variety of combinations in design and colour which  
can be worked out from it is almost endless. With Coloured  
Frontispiece and 13 Photographic Plates illustrating 44 patterns,  
and 4 Plates from the Author's pen drawings, showing 31 stitch  
diagrams and 11 complete objects. 4to, stiff paper cover, 2s. 6d.  
net; or cloth boards, 3s. 6d. net.

## **ART IN NEEDLEWORK**

A Book about Embroidery. By LEWIS F. DAY and MARY BUCKLE. Fourth Edition, revised and enlarged, with chapters on Modern Developments by MARY HOGARTH, Embroidereress. Containing 86 full-page Plates, reproduced from Photographs, and 45 Illustrations in the Text. Crown 8vo, cloth. 6s. net.

## **FUNDAMENTALS OF DRESS CONSTRUCTION**

By S. MANNING AND A. M. DONALDSON. A Practical and workable account of the main basis of all Dress Construction and the Problems connected therewith. Suitable for use in Schools, etc. 223 pages with about 150 illustrations, Appendix and full Index. 8vo, cloth, lettered. 7s. net.

## **MILLINERY**

By JANE LOEWEN. A Comprehensive Account of the Practical and Technical Principles of Millinery for Students, Amateurs, etc. 213 pages with 116 illustrations, including photographs of finished models, processes of construction, etc. 8vo, cloth, lettered. 7s. net.

## **DRAWING FOR ART STUDENTS AND ILLUSTRATORS.**

By ALLEN W. SEABY. Containing 220 pages, with over 70 Illustrations printed in Sepia, mostly full-page Plates, from drawings by Old and Modern Artists. 2nd Edition, revised and enlarged with further illustrations and a new chapter on Common Difficulties. Medium 8vo, cloth, paper sides. 12s. net.

## **THE ART OF PEN DRAWING**

For Students, Illustrators and Commercial Artists. By G. MONTAGUE ELLWOOD, Author of "Studies of the Human Figure," etc. A comprehensive illustrated treatise on the whole technique of drawing in pen and ink as applied to Illustration, Commercial Work, Architecture, Fashion Drawing, etc. With about 130 illustrations of pen work of the finest pen draughtsmen past and present, including many full-page reproductions. Medium 8vo, cloth, gilt, paper sides. 12s. net.

## **COMPOSITION**

An Introduction to the Principles of Pictorial Design, for the Use of Students, Art Schools, etc. By CYRIL C. PEARCE, R.B.A., Department of Fine Arts, University of Reading. A much-needed Treatise demonstrating the system underlying all Graphic Design, with 6 Plates in Colour, 28 Plates in half-tone, and about 130 line illustrations in the text, taken from the work of old masters and well-known artists of the present day, and from the author's own drawings, diagrams, analyses, etc. Medium 8vo, cloth, gilt, paper sides. 12s. net.

## **THE ART OF DRAWING IN LEAD PENCIL**

By JASPER SALWEY, A.R.I.B.A. A Practical Manual dealing with Materials, Technique, Notes and Sketching, Building up, Form and Style, Process Reproduction, etc. Second Edition, revised and enlarged. Containing 232 pages with 122 finely printed reproductions of selected Pencil Drawings of Land and Seascapes, Figure-Studies, Book-Illustrations, etc. Medium 8vo, cloth, gilt, paper sides. 12s. 6d. net.

## **SKETCHING IN LEAD PENCIL FOR ARCHITECTS AND OTHERS.**

By JASPER SALWEY, A.R.I.B.A. An introduction to the same author's "Art of Drawing in Lead Pencil," but devoted to sketching as differentiated from the making of finished drawings. A practical manual for the Student, Artist and Architect. Containing 111 pages and 56 illustrations, by well-known artists in the medium, and by the author. Medium 8vo, half-cloth. 7s. 6d. net.

## FASHION DRAWING AND DESIGN

By LOUIE E. CHADWICK. Illustrated by numerous examples of Historic Fashion Plates, Explanatory Sketches by the author, Figure Studies, and a series of about 80 full-page and double Plates of Contemporary Fashion Drawings by well-known artists. Large 8vo, cloth, lettered. 15s. net.

## SKETCHING FROM NATURE

A Practical Treatise on the Principles of Pictorial Composition. By F. J. GLASS. Dealing with Choice of Subject and Planning of Sketch, Tones, Exercises in Composition, Examples from the Old Masters, etc. With 4 plates in colour, 13 half-tone plates from drawings by the Author and from Old Masters, and 48 line illustrations from the Author's drawings. Medium 8vo, cloth, lettered, 10s. 6d. net.

"The book is a most thorough and conscientious piece of work and should go far in helping the teacher to solve the many problems that arise before satisfactory results can be obtained in this branch of art."—*The Times Educational Supplement*.

## PRACTICAL DRAWING

By E. G. LUTZ. A manual of practical directions, hints and suggestions on Materials and Instruments, Methods and Processes, Geometry, Perspective, Composition, Lettering, Figure and Costume Work, etc. With 170 Illustrations, comprising over 400 examples. Crown 8vo, cloth boards. 6s. 6d. net.

## GRAPHIC FIGURES. THE PRACTICAL SIDE OF DRAWING FOR CARTOONS AND FASHIONS.

By E. G. LUTZ. Illustrated by numerous full-page Drawings by the Author, after famous caricature artists, applying the methods found remarkably helpful in the Author's "Practical Drawing." Large crown 8vo, half-bound. 8s. 6d. net.

## PRACTICAL PICTORIAL COMPOSITION

A Guide to the Appreciation of Pictures. By E. G. LUTZ. 200 pages calling attention to the Principles of Construction in Pictures, with special reference to Unity, Repetition, Balance, Symmetry, etc. With about 300 pen and ink sketches by the Author of analyses of famous Paintings, etc. 8vo, paper sides. 8s. 6d. net.

## SUGGESTIONS FOR THE STUDY OF COLOUR

By H. BARRETT CARPENTER. A Series of 16 brief talks on Natural Colour Order—Harmony—Contrast—Discord—Keynotes—Intermingling—Effect of Lighting—Black and White, etc. Illustrated by 20 specially prepared Plates, printed in full Colour. 8vo, cloth, gilt. 8s. 6d. net. (*Second Impression.*)

## ON MAKING AND COLLECTING ETCHINGS

By Members of the Print Society, and edited by E. HESKETH HUBBARD. Containing Chapters on Etching Proper, Dry-point, Soft-ground, Mezzotint, and other Processes, Printing, etc. Illustrated by 10 whole-page reproductions, and numerous Diagrams. Second Edition, re-illustrated. 8vo, half-bound, 21s. net.

## THE HUMAN FORM ("Edle Nacktheit")

A Series of Artistic Photographic Studies from Life, including a number of youthful models. Selected and arranged by LOTTE HERRLICH. Each volume contains 20 charming full-page Plates from poses specially arranged for the use of Artists, Sculptors and Designers. Title in German. 3 Series. Imperial 8vo, boards. 4s. 6d. net each. Sold only to those interested in Art.

**LIVING SCULPTURE : A RECORD OF EXPRESSION IN THE HUMAN FIGURE.** By BERTRAM PARK and YVONNE GREGORY. With an historical and descriptive Introduction by G. MONTAGUE ELLWOOD. Comprising a Series of 47 full-page Studies of Selected Male and Female Figures with Descriptive Notes. The Introduction is illustrated by 9 plates, giving 16 examples of the Human Form in Prehistoric, Greek, Renaissance and newest Art. Small 4to, cloth, gilt. 21s. net.

### **THE HUMAN FORM AND ITS USE IN ART**

A Series of 118 Photographic Studies on 73 Plates from specially selected Female and Child Models, by F. R. YERBURY, including a Series of Male Studies by F. H. CROSSLEY, F.S.A. With an Introduction by G. M. ELLWOOD. Illustrated by 17 Photographic Plates and numerous Text Figures. With Descriptive Notes on the Poses. Large 8vo, cloth. 18s. net.

### **STUDIES OF THE HUMAN FIGURE**

By G. M. ELLWOOD and F. R. YERBURY. A series of 80 Photographic Studies from Male, Female, and Child Models. Introduction, including Diagrams and Drawings. Large royal 8vo, cloth. 16s. net. [Third Impression.]

### **THE HIEROGLYPHIC OR GREEK METHOD OF LIFE DRAWING** By A. A. BRAUN. An original method of teaching figure-drawing, with illustrative Diagrams and Sketches in the text, and 64 full-page Plates from Photographs of a specially selected female model. 8th Edition. 4to, paper. 15s. net.

### **THE CHILD IN ART AND NATURE**

By A. A. BRAUN. Containing chapters on Anatomy, Development, and Expression, and over 300 Illustrations from Photographs and Drawings of child poses, expressions, the Child Figure in Art. Second Edition, revised and enlarged. 4to, in stiff covers. 18s. net; or cloth, gilt. 21s. net.

### **THE HUMAN FIGURE**

An Analysis of its Construction and Pictorial Representation. By J. H. VANDERPOEL. With 54 full-page Plates and 300 smaller Illustrations, from the Author's Drawings. New Edition. Large 8vo, cloth. 16s. net.

### **FIGURE CONSTRUCTION**

A Brief Treatise in Drawing The Human Figure. By ALAN BENNET, Director of the Art Centre, New York, with Introduction By Prof. A. W. Dow. Containing 30 brief Lessons on Parts and Attitudes, etc. Illustrated by 49 Plates from four minute Sketches by Students, Photographs and Drawings by old Italian Masters. Large 8vo, cloth, lettered. 12s 6d net.

### **PRACTICAL ART ANATOMY**

By E. G. LURZ. With numerous Anatomical Diagrams by the Author, all clearly and fully lettered and explained, 8vo, cloth back. 8s. 6d. net.

### **LETTERING AND WRITING**

A Series of Alphabets and their Decorative Treatment, with Examples, and Notes. By PERCY J. SMITH. Containing 16 Plates in line, to a large scale, printed on boards. Large 4to, in Cardboard Portfolio. 6s. 6d. net.

### **LETTERING**

By A. E. PAYNE, A.R.C.A. Containing 20 full-page Plates of large-size Alphabets and Initials, with Preliminary Text, including Diagrams. 8vo, art paper covers. 3s. 6d. net.

## **THE ROMAN ALPHABET AND ITS DERIVATIVES**

A large-sized Reproduction of the Alphabet of the Trajan Column, By ALLEN W. SEABY. A Series of large Plates, printed from the wood blocks, and including typical examples of Renaissance, Gothic, and Modern Alphabets and Types. With Introduction and Descriptive Notes. Medium 4to, half-bound, lettered. 6s. 6d. net.

## **PENMANSHIP OF THE XVIITH, XVIIITH, AND XVIIIITH CENTURIES.**

A Series of Typical Examples from English and Foreign Writing Books. Selected by LEWIS F. DAY. With Notes on Penmanship by PERCY J. SMITH. Containing over 100 Examples, chiefly full pages. Crown 4to. 20s. net.

## **BEGINNER'S COURSE IN SHOW CARD WRITING.**

By RAY J. MATASEK. Presenting a systematic course in 64 pages and 43 Illustrations of Brush and Pen Strokes; Arrangement and Composition of Lettering; Egyptian, Italic, Full and Poster Block, Roman, Script, French, Tuscan, and Old English Alphabets; Numerals; Illustrated Suggestions for Shading and High Lighting, Scrolls, etc. Small square 8vo, stiff cardboard covers. 2s. 6d. net.

## **LONDON TRADESMEN'S CARDS OF THE XVIIITH CENTURY.**

By AMBROSE HEAL. Illustrated by upwards of 100 full-plate Collotype reproductions of typical specimens, selected from the Author's and other important collections. Crown 4to, bound in antique style. £2 2s. net.

## **DECORATIVE DEVICES IN INDUSTRIAL ART.**

A BOOK OF AMERICAN TRADE MARKS. Compiled by JOSEPH SINEL. A Series of 58 full-page Plates, illustrating about 250 Designs for Decorative Commercial Devices, by numerous well-known Artists, in various Styles, some printed in Tints. With brief Introduction. A novel, interesting, and stimulating collection. Large 4to, decoratively half-bound. 38s. net.

## **MODERN DECORATIVE ART IN ENGLAND**

A Series of Illustrations of its Development and Characteristics, with Introductory Text by W. G. PAULSON TOWNSEND. Large 4to, cloth, gilt. 25s. net.

TEXTILES, PRINTED FABRICS, WALL PAPERS, LACE AND EMBROIDERY, TAPESTRY, STENCILLING, BATIK, ETC. Illustrating on 80 Plates 178 examples, including 51 subjects beautifully reproduced in full Colour.

## **FURNITURE FOR SMALL HOUSES**

A Series of Designs. By PERCY A. WELLS. Containing 56 Plates reproduced from Photographs and Working Drawings by the Author, together with Illustrations in the Text. Small 4to, cloth. 12s. 6d. net.

"Mr. Wells's main concern is with the practical needs of a small house, and from this point of view his work is quite excellent. The photographs maintain the high standard which we associate with Messrs. Batsford's publications, and the book should be read and studied by all who are interested in the long-awaited renaissance of English cabinet-making."—*The Athenaeum*.

## **FIRST STEPS IN WATER-COLOUR PAINTING**

By MARTIN F. GLEASON, Supervisor of Art and Manual Training, Elementary Schools, Joliet, Illinois, U.S.A. Treating of Equipment—Mixing Colours—Plant-life Painting—Landscape, Illustration—Flat Washes, Mottled Colour, etc. With 3 Coloured Plates, illustrating 9 Sketches and 50 other reproductions of Water-Colours in Half-tone and Line. Small 4to, cloth, lettered. 9s. net.

## **INDUSTRIAL ARTS DESIGN**

A Textbook of Practical Methods in the Decorative Crafts. By WILLIAM H. VARNUM. With about 500 Figures and 85 Plates of Drawings and Photographs of Furniture, Woodcarving, Metal Objects, Jewellery, Pottery, etc., and Coloured Keyplates of Tints. Large 8vo, cloth, lettered. 18s. net.

## **PRIMARY INDUSTRIAL ARTS**

By D. F. WILSON, University of Wisconsin, U.S.A. For the Use of Teachers in Elementary Stages. The Text deals with Paper Cutting, Pictorial Composition, Stick-Printing, Clay Modelling, Pottery, Weaving, Basketry, etc., etc. With 110 illustrations in half-tone and line. Large 8vo, cloth. 10s. net.

## **HANDCRAFT IN WOOD AND METAL**

A Handbook for the use of Teachers, Students, Craftsmen, and others. By JOHN HOOPER and ALFRED J. SHIRLEY. With over 300 Illustrations from Drawings and Photographs. Second Edition, revised and enlarged. Large 8vo, cloth, lettered. 10s. 6d. net.

## **METALCRAFT AND JEWELLERY**

By E. F. KRONQUIST. A Complete Manual of Instruction for the making of Simple Jewellery and Metalwork. With 152 illustrations in half-tone and line of Operations, Processes, Modern Examples, etc. 8vo, cloth, lettered. 10s. net.

## **THE ART OF BRASS REPOUSSE**

By GAWTHORPE, Art Metal Workers to His Majesty. Fifth Edition, revised and enlarged. With 43 Illustrations from Photographs, etc. 8vo, paper covers. 2s. 6d. net.

## **THE PROCESS AND PRACTICE OF PHOTO-ENGRAVING.**

By HARRY A. GROESBECK, Jun. Containing 260 pages, and 280 Diagrams and Illustrations, including Metal Plates; Lenses and Light; Making Line and Half-tone Negatives; Printing on Metal; Etching; Colour Work; Electrotyping; Stereotypes; Repairs, etc. Demy 4to, cloth, gilt, lettered. 38s. net.

## **FOOT-POWER LOOM WEAVING**

A full and Practical Treatise. By EDWARD F. WORST. Containing 11 Chapters, 278 pages, with a full Index, and 555 Figures of Weaving Pattern Diagrams, etc. Large oblong 4to, cloth, gilt and lettered. 25s. net.

## **SAMPLERS AND STITCHES**

A Handbook of the Embroiderer's Art. By Mrs. ARCHIBALD CHRISTIE. Containing 34 full-page Reproductions from Photographs, a Frontispiece in Colour, and 239 Text Drawings. Crown 4to, boards, canvas back. 25s. net.

"Many books have been written on this fascinating subject, but we cannot remember coming across any more comprehensive and complete work than Mrs. Christie's. In the name of all needlewomen there should be accorded to Mrs. Christie a very grateful vote of thanks."—*Country Life*.

## **ETCHING CRAFT**

An Illustrated Guide for Students and Collectors. By W. P. ROBINS, R.E., with a Foreword by MARTIN HARDIE, of the Victoria and Albert Museum. Second Impression, containing 250 pages on History, Technique, the work of Great Etchers, Drypoint, Aquatint, etc. Illustrated by 100 Plates of Etchings by Dürer, Rembrandt, Hollar, Whistler, Brangwyn, John, Meryon, Forain, Zorn, and others. Large 8vo, half-bound, gilt. 15s. net.

## THE ART AND PRACTICE OF ETCHING

A Practical Manual, including Mezzotint, Aquatint, and Dry-point. By HUGH PATON. Treating of Apparatus, the Plate, the Press, the Studio, Mordants, the Proof, Working Methods, Papér and Printing, the Painter-Etcher, Colour Etching, etc. Illustrated by 1 Colour and 3 Monochrome Etchings by the Author, numerous practical Diagrams, Details of Texture, Work in Stages, and Reproductions of Etchings by craftsmen of former and modern times. Medium 8vo, cloth, gilt. 21s. net.

## PATTERN DESIGN

For Students, treating in a practical way the Anatomy, Planning, and Evolution of Repeated Ornament. By LEWIS F. DAY. Containing about 300 pages, and 300 practical Illustrations from specially prepared Drawings and Photographs of the Principles of Repeat Design, the "Drop," the "Spot" Geometrical Ornament, etc. Third Impression. Demy 8vo, cloth, gilt. 10s. 6d. net. "Every line and every illustration in this book should be studied carefully and continually by every one having any aspiration toward designing."—*The Decorator*.

## ENAMELLING

A Comparative Account of the Development and Practice of the Art. For the Use of Artists, Craftsmen, Students, etc. By LEWIS F. Day. With 115 Illustrations, reproduced from Special Drawings and Photographs. Demy 8vo, cloth, gilt. 8s. 6d. net.

## ALPHABETS, OLD AND NEW

With 224 complete Alphabets, 30 Series of Numerals, many Ancient Dates, etc. Selected and Arranged by LEWIS F. DAY. With a short account of the Development of the Alphabet. Crown 8vo, cloth. 7s. 6d. net.

"A book which has, perhaps, proved more helpful than any ever before issued on the subject of alphabets."—*The Decorator*.

## THE "PRACTICAL CRAFTS" SERIES

### MODERN PRACTICAL JOINERY

A Treatise on Joiners' Work by Hand and Machine. By GEORGE ELLIS. Fifth Edition, revised and enlarged, containing 592 pages of Text, and over 1400 Illustrations, including 41 Photographic Plates and 20 double-page and folding Plates. Complete in 1 vol., 4to, cloth. £2 5s. net, or separately in 3 vols., half-bound, Vol. I., 15s. net; Vol. II., 18s. net; Vol. III., 12s. 6d. net.

"Mr. Ellis's great work has now become a classic. It is known to experts everywhere as the most comprehensive and most reliable work on joinery in the English language."—*Illustrated Carpenter and Builder*.

### MODERN PRACTICAL CARPENTRY

By GEORGE ELLIS. Containing a full description of Methods of Constructing and Erecting, and various Structural Details. 450 pages, with 1100 clear and practical Illustrations. Third Edition, revised and enlarged with new illustrations added. Crown 4to, cloth. 30s. net; or separately in 2 vols., half-bound, 16s. each net.

"... It excels nearly all in its completeness. There is a large number of clear detailed drawings. The production of the work is worthy of the excellence of the subject-matter."—*The Carpenter and Builder*.

"... Anyone confronted with an unusual difficulty would almost surely find its solution somewhere in the volume."—*The Building News*.

### MODERN CABINET-WORK, FURNITURE AND FITMENTS

An Account of the Theory and Production of all kinds of Cabinet-work and Furniture. By PERCY A. WELLS, and JOHN HOOPER. Containing 400 pages, with over 1000 Practical Workshop Drawings, Photographs, and Original Designs. Third Edition, revised and enlarged. Crown 4to, cloth, lettered. 25s. net.

## **LESSONS IN CARPENTRY AND JOINERY**

By GEORGE ELLIS. Presenting a carefully graduated series of subjects in 39 large Plates, fully lettered and dimensioned, and comprising about 500 figures and numerous practical details. With full Descriptive Text. Oblong demy 4to, cloth, lettered. 10s. 6d. net.

## **BUILDING REPAIRS.**

A Practical Guide to their Execution. By ERNEST G. BLAKE, Containing over 200 pages, with 8 Practical Diagrams, from the Author's Drawings. Demy 8vo, cloth. 8s. 6d. net. Contents:—Bricklayer, Tiler, Slater and Mason, Shoring, Carpenter, Plumber, Hot-water Fitter, Electrician, Plasterer, Painter, Paperhanger, and Glazier.

## **STAIR BUILDER'S GUIDE**

A Treatise on the Theory and Practice of the Construction of Straight Flight, Platform, Cylindrical and Elliptical Stairs. By MORRIS WILLIAMS. Containing 250 pages and 30 chapters. Including 327 clear and practical Diagrams, and 31 Photographic Illustrations. Large 8vo, cloth, lettered. 12s. 6d. net.

## **PLASTERING : PLAIN AND DECORATIVE**

A Practical Treatise on the Art and Craft, including sections on Materials, Processes and Appliances. By WILLIAM MILLAR. With a Chapter on the Historical side by the late G. T. ROBINSON, F.S.A. Fourth Edition, revised, remodelled and largely rewritten by GEORGE P. BANKART, Author of "The Art of the Plasterer," etc., with new Chapters on Lime Stucco Modelling, Modern Plaster-work, etc. Containing upwards of 400 pages, with 122 photographic plates and 123 line illustrations in the text, making in all 380 illustrations of the finest Historic and Modern Work, Working Drawings of Processes and Methods, Measured Drawings, Mouldings, etc. Small 4to, cloth, lettered. 30s. net.

## **THE SMALLER HOUSE OF TO-DAY**

By GORDON ALLEN, F.R.I.B.A., winner of the *Daily Mail* prize for the best £1,500 House. A Review of the most recent type of smaller house demonstrating how such houses may be built to the maximum of good design, good construction and sound comfort at the minimum price. With 2 plates in colour, 64 photographic illustrations and 153 line illustrations, making a total of 219 in all, of exteriors, interiors, plans, details, drainage and heating systems, gardens, etc., by the author and other well-known architects. 8vo, cloth, lettered. 10s. 6d. net.

"A most useful addition to an architect's library and a valuable incentive to the discerning layman who wishes to have a satisfying home of his own."—*R.I.B.A. Journal*.

*Uniform with the above—a useful inexpensive and well-planned volume on Cottages and Middle-Class Houses.*

## **THE CHEAP COTTAGE AND SMALL HOUSE**

By GORDON ALLEN, F.R.I.B.A. New Edition, remodelled and enlarged, containing over 150 Illustrations from Drawings and Photographs of Cottages and their Plans, Housing Schemes, etc., from the latest Designs. 8vo, cloth. 8s. 6d. net.

## **PRACTICAL DRAPERY CUTTING**

A Handbook on Cutting and Fixing Curtains, Draperies, etc., with Descriptions and Notes, for the use of Upholsterers, Cutters, and Apprentices. By E. NOERTZLI. Illustrated by 30 full-page Plates. Demy 4to, cloth, gilt. 15s. net.

## **MODERN TECHNICAL DRAWING**

For Students, and all connected with the Building Trades. By GEORGE ELLIS. Containing a description of the methods of preparing Detail and Working Drawings, with accounts of Instruments, Lettering, Perspective, Projection, etc., and numerous full-page and smaller Illustrations from the Author's Drawings. Second Impression. Large crown 8vo, cloth, lettered. 10s. 6d. net.

## **PRACTICAL MATHEMATICS**

A complete Course of Instruction for Students and Practical Men, adapted to the requirements of the Board of Education "Lower Stage" Examination. By E. L. BATES and F. CHARLESWORTH. Containing 520 pages, with over 330 Illustrations and numerous Exercises and Answers. Crown 8vo, cloth. 7s. 6d. net. [New Impression in preparation.

## **QUANTITIES**

A Textbook on Methods of Valuation and Measurement of Builders' Work. By BANISTER FLETCHER. Ninth Edition, Revised and brought down to date. With numerous Memoranda, Formulae, and Rules. Containing upwards of 450 pages, with 10 Folding Plates and 100 other Diagrams in the Text. Crown 8vo, cloth gilt. 10s. net.

## **PROF. BANISTER FLETCHER'S VALUABLE TEXTBOOKS FOR ARCHITECTS AND SURVEYORS.**

*Crown 8vo., cloth gilt, price 10s. net. each.*

## **VALUATIONS AND COMPENSATIONS.**

A comprehensive Treatise on Valuing Land and Houses, with chapters on the Finance Act, 1909, Rating, Mortgage, with the text of all recent Acts, Rules, etc. Fourth Edition, re-written and greatly enlarged, including Forms of Precedents and an extensive series of Valuation Tables.

## **DILAPIDATIONS.**

Sixth Edition, thoroughly revised and enlarged, with all recent Legal Decisions, and a chapter on Fixtures.

## **LIGHT AND AIR.**

With Methods of Estimating Injuries, Reports of most recent Cases, etc. Illustrated by 27 Coloured Plates. Fifth Edition thoroughly revised. [Now out of print.

## **ARBITRATIONS.**

A Text-book with the chief Cases and Forms, Rules, etc. Fourth Edition, revised and largely re-written and brought down to date, with reports of all recent cases, etc.

---

## **ARCHITECTURAL RENDERING IN WASH**

By VAN BUREN MAGONIGLE, F.A.I.A. Containing 160 pages of text, devoted principally to the finished rendering of Elevations, Sections, Plans, Details, etc. With Chapters devoted to the Preliminary Steps. With 25 photographic reproductions of fine rendered examples by the Author and other famous Architects, a Frontispiece in Colour, and several line diagrams. New and Cheaper Students' Edition. Medium 8vo, cloth. 15s. net.

## **ARCHITECTURAL PRACTICE AND PROCEDURE**

A Handbook for Students and Practitioners. By HAMILTON H. TURNER, F.S.I. A Review of the Business Side of an Architect's Work and of the Organisation of the Office. Containing 340 pages, with numerous Specimen Forms and Schedules, Plans, Reports, Illustrations, etc. 8vo, cloth. 15s. net.

## **A WINDOW DICTIONARY**

By W. F. CRITTAL. Containing about 50 pages comprising descriptions of about 250 terms used in connection with window openings. With useful marginal diagrams, list of Abbreviations used, and a brief Introduction. Small 8vo, cloth, paper sides. 2s. 6d. net.

## **ARCHITECTURAL COMPOSITION**

By NATHANIEL CORTLAND CURTIS, A.I.A. Illustrated with numerous Drawings by the Author. Small 4to, cloth, lettered. 30s. net.

## **THE ESSENTIALS OF A COUNTRY HOUSE**

By R. A. BRIGGS, F.R.I.B.A. Containing 218 pages and 71 Illustrations from Photographs and Drawings, of Views of Houses of varying size erected from the Author's Designs. Large 8vo, cloth, gilt. 8s. 6d. net.

## **THE CONSTRUCTION OF A HOUSE**

A Series of 40 Plates of Plans, Elevations, Sections, and Details, with Descriptive Text, of a Country House, from the Author's specially prepared Drawings. By CHARLES GOURLAY, B.Sc. F.R.I.B.A. Second Edition, revised and condensed. Royal 4to, cloth. 7s. 6d. net.

## **WHERE THE GREAT CITY STANDS**

A Study in the New Civics. By C. R. ASHBEE, M.A., F.R.I.B.A. Illustrated by over 120 Drawings, Photographs, Diagrams, and Plans. 4to, in blue boards, with cloth back. 25s. net.

## **THE HALF-TIMBER HOUSE**

Its Design, Plan, and Construction. By ALLEN W. JACKSON. With Frontispiece in Colour and 65 full-page Photographic Plates, showing Old and Modern Examples, also Plans and Interior Views. Small 4to, cloth. 18s. net.

## **BUNGALOWS**

Their Design, Construction, and Furnishing, with suggestions also for Camps, Summer Homes, and Cottages of similar character. By HENRY W. SAYLOR. With over 200 Illustrations. 4to, cloth. 18s. net.

## **RESIDENTIAL FLATS OF ALL CLASSES, INCLUDING ARTISANS' DWELLINGS.**

A Practical Treatise on their Planning and Arrangement. By SYDNEY PERKS, F.R.I.B.A., P.A.S.I. Containing 226 Plans and Illustrations of Examples by leading architects in England, the Continent, and America. Imperial 8vo, cloth, gilt. 25s. net.

## **PUBLIC BATHS AND WASH-HOUSES**

Their Planning, Arrangement, and Fitting, with Chapters on Turkish and other Special Baths, Public Laundries, Heating, Water Supply, etc. By ALFRED W. S. CROSS, M.A., F.R.I.B.A. Containing 284 pages, with 274 Illustrations of Plans, Elevations, and Constructive and Engineering Details. Imperial 8vo, cloth, gilt. 25s. net.

## MODERN THEATRE CONSTRUCTION

By EDWARD BERNARD KINSILA. An Analysis of the Principles of Theatre Planning and Equipment for Modern Needs, including a special section on Cinematograph Houses. With 48 Plans and Illustrations. A useful Standard Book on Theatres and Cinemas. Imperial 8vo, cloth. 18s. net each.

## MODERN THEATRES

By IRVING PICHEL, New York, U.S.A. Giving many plans photographs and descriptions of the recent theatres; dealing with construction, seating, lighting, both of the stage and auditorium, machinery and equipment, etc. With 64 illustrations. Crown 8vo., 12s. 6d. net.

## THE COLONIAL HOUSE.

By JOSEPH EVERETT CHANDLER. Illustrated by 140 full-page Plates, chiefly of exterior views, with details, as Chimneys, Cupolas, Doorways, Porches, Garden-Houses, etc., and some interior views and plans. New Edition. Small 4to, cloth. 24s. net.

## HOW TO ESTIMATE

Being a Complete Analysis of Builders' Prices. Giving full details of Estimating for every class of Building Work, with thousands of Prices, and much useful Memoranda. By JOHN T. REA, Surveyor. Fourth Edition, revised and enlarged, with Supplement of up-to-date Prices and Memoranda. (*Fourth Impression*). With about 350 Illustrations. Large 8vo, cloth. 15s. net.

## BUILDING CONSTRUCTION AND DRAWING

(ELEMENTARY). By CHARLES F. MITCHELL, assisted by GEORGE A. MITCHELL. Tenth Edition, Revised and greatly Enlarged. Containing 470 pages of Text, with over 1100 Illustrations, fully dimensioned. Crown 8vo, cloth, gilt. 6s. 6d. net.

"The book is a model of clearness and compression, well written and admirably illustrated, and ought to be in the hands of every student of building construction."—*The Builder*.

## BUILDING CONSTRUCTION (Advanced)

By CHARLES F. MITCHELL, assisted by GEORGE A. MITCHELL. Containing 900 pages of Text, with over 800 Illustrations, fully dimensioned. Tenth Edition, thoroughly Revised and Enlarged. Crown 8vo, cloth, gilt. 10s. 6d. net.

"Mr. Mitchell's two books form unquestionably the best guide which any student can obtain at the present moment. In fact, so far as it is possible for anyone to compile a satisfactory treatise on building construction, Mr. Mitchell has performed the task as well as it can be performed."—*The Builder*.

## BUILDING CONSTRUCTION PLATES

By A. BUCHANAN and W. H. HUDSON. With pages for Students' Notes. Vol. I. ELEMENTARY STAGE, 40 Plates. Vol. II. ADVANCED STAGE, 50 Plates. (*New Impression, revised*). Oblong 8vo, in stout paper covers. Part I, 5s.; Part II, 5s. 6d.

"Mr. Buchanan's extensive teaching experience has enabled him to set down just what is most essential to students, and the drawings, all prepared by the author, are clear, definite, and helpful."—*Municipal Engineering*.

## REGULATIONS OF THE LONDON COUNTY COUNCIL RELATING TO STRUCTURAL STEEL WORK (London Building Act Amendment, 1909) AND TO REINFORCED CONCRETE, 1916.

As drawn up and sanctioned by the Local Government Board. A Reprint of the Official Text, with Notes, Explanations, and Worked Examples, including numerous Illustrations, by EWART S. ANDREWS, B.Sc., M.C.I. Second Edition, revised and extended. Crown 8vo, cloth, lettered. 4s. net.

## THE STRUCTURAL ENGINEER'S POCKET BOOK.

By EWART S. ANDREWS, B.Sc. Containing 356 pages, with numerous Formulae, Tables, Practical Illustrative Diagrams, etc. Small 8vo (pocket size), cloth. 18s. net.

## STRUCTURAL DESIGN IN STEEL FRAME BUILDINGS.

Comprising the detailed design of typical large Structural Members of Steel Frame Buildings, with calculations and working drawings. By PERCY J. WALDRAM. With 8 double-plate Working Diagrams. 4to, half-bound in cloth, lettered. 12s. 6d. net.

## CLARKE'S POCKET-BOOK OF TABLES AND

MEMORANDA FOR PLUMBERS, BUILDERS, SANITARY AND ELECTRICAL ENGINEERS, &c. By J. WRIGHT CLARKE. New and revised Edition. Small pocket size, leather, 2s. 6d. net. Or in celluloid case, 3s. 6d. net.

"It is obviously one of those things a tradesman should carry in his pocket as religiously as he does a foot-rule."—*The Plumber and Decorator*.

## A MANUAL OF TECHNICAL PLUMBING AND SANITARY SCIENCE.

By S. BARLOW BENNETT. Fourth Edition, revised and enlarged, by WALTER SCOTT. Containing 300 pages and 400 clear Illustrations. Royal 8vo., cloth, 9s. 6d. net.

## DRAINAGE AND SANITATION

A Practical Exposition of the Conditions vital to Healthy Buildings, their Surroundings and Construction, their Ventilation, Heating, Lighting, Water and Waste Services. By E. H. BLAKE, F.S.I., M.R.S.I. Second Edition, revised and corrected. Containing 500 pages, with 400 Illustrations. Large 8vo, cloth. 15s. net.

## INDEX OF AUTHORS' NAMES

- Adam, Decorative Work, 11  
Adams, Office Practice, 27  
Allen, Cheap Cottage, 27  
— Smaller Houses, 27  
Anderson, Greece and Rome, 2  
— Italian, 5  
Andrews, Structural Engineer's  
Pocket Book, 81  
Andrews, Steelwork Regs., 80  
Animal Studies, 22  
Artworkers' Studio, 17  
Ashbee, Teaching Art, 15  
— Great City, 29  
Bailey, Spanish Towns, 5  
Bates and Charlesworth, Mathe-  
matics, 80  
Batsford, Mural Monuments, 4  
— Decorative Art, 12  
Belcher, Essentials in Arch., 1  
Bell, Old Pewter, 14  
Benn, Nation's Treasures, 16  
Bennett, Figure Construction, 23  
— Plumbing, 31  
Berk, Proverb Story, 6  
Blake, Building Repairs, 27  
— Sanitation, 51  
Blashfield, Mural Painting, 20  
Blum, History of Art, 17  
Bode, Italian Furniture, 11  
Bonser, Industrial Arts, 8  
Brandon-Jones, Stichery, 20  
Braun, Life Drawing, 23  
— Child in Art and Nature, 23  
Briggs, Essentials, 28, 29  
Brock, British Sculpture, 20  
Brown, Applied Drawing, 21  
Buchanan, Building Construction  
Plates, 30  
Budden, Gothic Churches, 4  
Burton, Porcelain, 14  
Butterfield, Fences, &c., 6  
— Floral Design, 18  
Caffin, History of Art, 16  
— Architecture, 1  
— Picture Study, 20  
Campbell, Arch. Drawing, 28  
Candee, Tapestry, 18  
Capito, Caretto, 16  
Carpenter, Colour Study, 22  
Chadwick, Fashion Drawing, 22  
Chamberlain, How we are Fed, 8  
— How we are Clothed, 8  
Chandler, Colonel House, 30  
Chancellor, London, 7  
— Regency in England, 7  
Cheney, Modern Art, 19  
Christie, Samplers, 25  
Cladel, Rodin, 20  
Clarke, Pocket Book, 81  
Colasanti, Plasterwork, 11  
Colour Schemes, 26  
Cook, Hobby-horses (Poems), 17  
Cox, Church Furniture, 3  
— County Churches, 4  
Cox (K.), Painting, 20  
Cram, Church Building, 3  
Crane & Day, Moot Points, 14  
Crittall, Window Dictionary, 29  
Cross, Public Baths, 29  
Crossley, Gothic Mon's, 3  
— Church Woodwork, 3  
Curtis, Arch. Composition, 29  
Davie, Kent and Sussex, Cotswo-  
ld and Surrey Cottages, 4  
Davison, Building Arts, 2  
Dawber, Cotswoold Cottages, 4  
Day, Alphabets, 26  
— Enamelling, 26  
— Moot Points, 14  
— Needlework, 21  
— Pattern Design, 26  
Day, Penmanship, 24  
De Forest, History of Art, 16  
De Mauri, Vinovo, 15  
De Palencia, Costume of Spain, 19  
De Toldo, Bookbindings, 18  
Doogue, Making a Lawn, 6  
Earle, Lampshades, 19  
Eberlein, Walls and Ceilings, 6  
— Rooms and Porches, 6  
— Inns, 7  
Edmondson, English Wallpapers,  
13



**PRESIDENT'S  
SECRETARIAT**

**LIBRARY**